



March 1991

Vol. 4

Nº 6

Price £2.00

Archive

The Subscription Magazine for Archimedes Users



Coroutines in C

BASIC plots to Draw files

Tips for big memory users

Using the PC Emulator – Part 8

Writing Maths – Equasor

Reviews: PenDown Update, Bookbinder, Orrery,
Honeypot Lane

Printing problems?

Sorry about the slightly duff printing of the last edition of Archive. The boxes around the headings were all rather faded. The reason was that I was using a 600 d.p.i. Laser Direct HiRes rather than the 300 d.p.i. Mac Laserwriter. So why should a better printer produce a worse output? Basically, the Laser Direct produced the shading using such tiny dots that the offset litho printing process could not cope with it. What I have done this time is to alter the type of shading used so that the dots are a bit bigger and (hopefully) more easily printable.

Not quite so late this time?

Thanks to Impression (which I am more and more impressed with every day) I have managed to shorten the time taken to produce the magazine quite considerably. So, over the next few months, I hope to get Archive back on schedule.

A gauntlet for Risc User!

Now that Acorn User, Archimedes World *and* Archive all use Impression for production of their magazines, don't you think it's about time that Risc User followed suit? Well, I wouldn't expect them to use Impression, but have they got enough faith in their own product, Ovation, to ditch their Apple Macs?!?!

More competitions, please.

We're very grateful to Colin Singleton for his consistent work in producing the monthly Competition Corner, but I think it's time he had a bit of help from others. It's very difficult to keep producing new ideas every month, so if you could help, either write to me or direct to Colin.

More Wimp stuff, please.

We've had quite a number of folk asking us for more articles about programming in the Wimp environment. People were pleased with the start that Alexander Goh made but were sad that it stopped rather abruptly. So were we and, if Sandie is reading this, I hope he will consider carrying on where he left off.

Once again, many thanks to readers and contributors alike for making Archive a joy to produce.

With best wishes,



Government Health Warning – Reading this could seriously affect your spiritual health.

We have continued to pray for all who have been caught up in the Gulf conflict and are grateful to God that the fighting is now over. Even so, we must continue to pray for the leaders of the nations involved, that they might bring about a just and lasting peace in the region.

The ending of the Gulf War is also particularly important for the people of sub-Saharan Africa. This is because the Gulf War has diverted the world's attention away from the terrible plight of those suffering from, or heading rapidly towards, famine in Africa. So, let's hope and pray that some of the suffering in Africa can now be averted. We will shortly be sending a donation to TEAR Fund to help with African famine relief and we would urge you to join with us, either by sending money direct to a relief agency, or by sending it to us and we will direct it through TEAR Fund. Thank you.

Archive

Volume 4 • Nº 6 • March 1991

Contents

Products Available	2	Shareware Discs Nºs 25 & 30	44
Hints & Tips.....	5	Econet Column.....	45
Comment Column.....	13	Writing Maths – Equasor.....	47
PipeLine	19	Ten Tips for those with bigger memories.....	52
Contact Box	21	PenDown update	54
Coroutines in C	23	Bookbinder.....	56
Languages Column	28	Help!!!.....	57
Multi-media Column.....	33	Help Offered	57
Using the PC Emulator – Part 8..	37	Orrery Version 1.3	57
Matters Arising	39	Honeypot Lane.....	60
Small Ad's	40	Fact-File	61
Competition Corner	41		
BASIC Plots converted to Draw files.....	42		

Products Available

• **Data cartridges for tapestreamers** – We have found a better source of data cartridges for tapestreamers and can do the 60M cartridges for £23 and the 150M cartridges for £26. The tapes for the 1 Gbyte tapestreamer which we advertise at £45 each are, apparently, just ordinary 2 hours DAT tapes that you could buy from W.H.Smiths' or such-like for £8 or 9 and then formatted. It takes about 4 hours to format which is why Oak charge so much for them.

• **DataStore Utility Disc 2** – A second disc of utilities is now available for £14.95 inc VAT or £14 through Archive. It contains: A desktop backdrop with a difference, a desktop toolbox window, a disc indexing program, a file activity monitor showing exactly which files are currently open, a list of BT phone code and areas, a utility which collects sprite name, system variables etc and enables you to set up your computer quickly at switch-on, a viewdata frame display utility, a utility that will replace your desktop A icon with an animation(!), an on-line manual utility and a fun demo.

• **Disc magazine** – A.S.T.E. Syracuse is an Archimedes disc magazine produced on an amateur basis. With the first issue, costing £4.99, you get a total of three discs; one containing the magazine itself and then two discs of PD software. The organisers, B Browne and A Kells, insist that it is not, as some magazine reports have said, a PD library.

• **DTP (and other) utilities** – A newly formed company, Design Concept, has 11 utilities mainly intended for DTP users at various prices from £1 to £2 each. We haven't got space to detail them all here but it includes things like a shading facility for !Draw, a way of printing out all the fonts you have got, a converter from X-window bitmap fonts and a converter which stipples a colour image to two colours. Write to Design Concept for a full list. We hope to get review copies soon.

• **Educational management software** – Cogent Software have produced two packages for educational establishments. The first, Monitoring and

Reporting, provides facilities for recording, analysing and reporting on students' performance. The basic price of the package is £400 for a secondary school, £200 for a middle school or £150 for primary or special schools. There are additional text files for different subject areas at £50 or £65 each. The second package, Curriculum Auditing, allows you to cross-reference the experiences the pupils are given with the skills, knowledge and concepts outlined in the school's curriculum. The pricing for this is similar to the first package. Also available from Cogent Software are optical mark readers which tie in with the management packages.

• **Educational software** – Chalksoft, well known for its educational software on various computers including the BBC Micro has now turned its attention to the Archimedes. Titles available include: Puncman, programs 1 to 7, (ages 7 to 15+) cover various aspects of english; Spelling – week by week (ages 6 to 14+); Reversals (ages 8 to 14+) help with the problems of d/b, p/q etc; House of Numbers (ages 6 to 13) covers maths for key stage 2; First Words & Pictures and Words & Pictures (ages 3 to 7+) concentrate on early words, matching them with pictures; Letters & Pictures (ages 6 to 8+) introduces word building skills; Numbers & Pictures (ages 4 to 6+); Maps & Landscapes (ages 9 to 14); Keyboard player, music for ages 8 to adult; Note Invaders, a musical game for ages 7 to adult and Mark Master for secondary or tertiary administration.

• **Flight Path** – a simulation from Storm Software aimed at 9 year olds + sets you up as the pilot of an airliner (and owner of the company) and gets you to fly the plane and run the company. It brings in aspects of maths, geography, english, science and history. Available now in Archimedes format for £36.95 inc VAT or £32 through Archive.

• **Fonts galore** – A newly formed company, Design Concept, has 8 innovative new fonts for sale at 'silly' prices (my word, not theirs); £1.50

per font plus £2 carriage. If you want to see the sort of things they are offering, have a look at the advert on page 17. We haven't actually got the fonts for review yet but we'll let you know what we think when we've seen them. Apparently, they are designed from scratch using FontEd and include "proper hinting of the characters".

• **Genesis I to II upgrade** – If you want to upgrade from Genesis I to II, all you need to do is to send your Editor disc to Oak Solutions with a suitable cheque or official order and they will send you a complete new pack. The cost of the upgrade is £34.95 + VAT for education users or £59.95 for non-education folk. Please do not send it to Norwich Computer Services.

• **High speed SCSI drives** – One of the advantages of SCSI is that, at the moment, "everybody is doing it" – and that means all the more commonly used computers whose names I will refrain from using. High volume production, of course, means lower prices such as we have achieved by using removable drives that were being sold into the Apple Mac market. In the same way, we have managed to find some extremely cheap and extremely fast fixed 48M drives produced by ZCL who are also selling them into the Atari and Commodore markets and for PC's – there, I've said it!

They are actually 52M drives that format to about 48.6M; they have an average access time of 17ms and run at up to 1,000 Kbytes/sec (yes, 1Mbyte/sec) using an Oak SCSI interface. The "alternative test" that we use (copying a large directory with many files) takes under 7 secs. These compare with about 600 Kbytes/sec and 9.3 secs for a standard Oak 45M drive but I haven't got any of the new HS or Worrawinnie Oak drives in stock to test for comparison. (They will be coming into stock tomorrow, but the magazine has to be at the printers tomorrow(!) so I will put the results on the Price List.) The prices are £520 for an internal 48M drive with podule and £590 for an external.

The internal drives look identical to Oak's drives but the external drives come in a strange-looking, yukkier brown colour, extremely compact metal case with no cooling fan. The drive is mounted on its side and sits in a metal cradle made of white

plastic coated metal rods (a bit like a plate rack!) to stop it falling over. Still, when you look at the price, it has to be worth considering, and if you are worried about quality (which I have to confess, I am slightly) they are guaranteed for years. This Archive price comparison may help you see if it is worth considering these drives as compared with the "zero-defect" policy and known good customer relations policy of Oak Solutions. The prices include Oak podule, VAT and carriage and the figures in brackets are the price per Mbyte.

Internal drives

Worrawinnie 45M	£440	(£9.78)
High Speed 40M	£520	(£13.00)
ZCL 48M	£520	(£10.83)

External drives A300/400

Worrawinnie 45M	£490	(£10.89)
High Speed 40M	£720	(£18.00)
ZCL 48M	£590	(£12.29)

External drives A3000

Worrawinnie 45M	£490	(£10.89)
High Speed 40M	N/A	
ZCL 48M	£590	(£12.29)

• **Midnight Graphics' Tracer** – Now you can turn your sprites into !Draw files with this impressive utility from Dabhand Computing. The potential for DTP and improving scanned pictures is tremendous. We hope to have a review very soon. The price is £59.95 from Dabhand or £56 through Archive.

• **MultiStore II** – Minerva have released a new version of MultiStore (still £250 through Archive) which features improved packaging and a new style ring binder and box "which give the package a much more professional image". Existing users can get an upgrade to the new software (but not the new packaging!) at a cost of £11.75 for the two new discs. MultiStore II has a new file format but, to overcome this problem, Minerva provide a transfer utility so that you can convert your old files to the new format. Minerva say, "The changes to MultiStore will not be immediately apparent to end users but some will notice an increase in speed".

• **NStore II** – HS Software have released a new version of NStore2, their National curriculum record keeping package, still £29.95 inc VAT.

Existing users can get an upgrade to the new software by returning their original disc to H.S. with a cheque for £5.00. NStore II has had many new facilities added in the light of ideas and suggestions made by teachers and advisors using the original package. These include improved ranking and alpha sorting, improved printing options, transfer of class data between discs and block data entry for groups of Statements of Attainments. Subject specific versions for secondary schools can be obtained containing levels 1 to 10 in a particular core subject. Science is available now and Maths and English are due in April.

- **PD library** – Westbourne Services have just started a PD library for the Archimedes. The discs are £1.50 each. Westbourne Services will supply a sample disc and catalogue for £1.

- **Structural analysis of 2D frames** – Civil engineers will be pleased to see that the power of the Archimedes has been harnessed to provide structural analysis of 2D frames and grids. Vision Six have two programs for each – an entry level (£150 +VAT each) allowing up to 32 items and a

full version (£450 +VAT for frames and £300 +VAT for grids) where the number of items is only limited by the available memory. There is a discount if you buy both a frames and a grids program at the same time. "Never knowingly undersold" – Vision Six say that if you can find a better or even equivalent piece of software sold commercially for ANY micro at a lower price, they will refund the difference!

- **'Two' productivity tools** – Ian Copestake Software has produced TWO – Task and Window Organiser which consists of various utilities to help you keep your desktop tidy and to set up various tasks more quickly and easily plus a number of other bits and pieces of applications. This is especially aimed at schools. £19 + VAT or £60 +VAT for a site licence.

Review software received...

We have received review copies of the following software: Carewares 4 and 6, !Voice-Builder from MJD Software, ASTE Syracuse disc magazine. **A**

~~Whirr! Hum! Whirr!~~ Silence!

Yes! We can offer you silence at last.

Now available for the 310 / 440 range.

A simple plug-in hardware module.

So easy - Almost anyone can fit it!

Full instructions.

Price £18:00p + Vat.

Full details available from:

Ray Maidstone.

421 Sprowston Road, Norwich, NR3 4EH.
Tel. (0603) 407060 Fax.(0603) 417447



Hints and Tips

• **Archimedes vs BBC variable formats** – There are some differences between the way that string and real variables are held on the BBC computer under BASIC 1 and 2, and on the Archimedes under BASIC 5.

String Variables – On the BBC using BASIC 1 or 2, string variables are pointed to by a 'string information block' which consists of:

- +0 for 4 bytes : address of start of string
- +4 for 1 byte : space allocated
- +5 for 1 byte : current length of string

When a string is allocated, if the length is under 8 bytes, then the space allocated is the same as the length of the string. If over 8 bytes, then an extra 8 bytes is allocated to allow the string to grow by that amount before it has to be moved. When the string changes length to more than its allocation, it has to be moved to the end of the HEAP. Unfortunately, BBC BASIC has no 'garbage collection' routines, so the previous space is unusable. This was why it was recommended that, when allocating strings which would grow in length, it is better to allocate them first with the largest length needed.

On the Archimedes using BASIC 5, the string information block consists of just:

- +0 for 4 bytes : address of start of string
- +4 for 1 byte : current length of string

without the space allocated. The space allocated seems to be up to the next 4-byte boundary. When strings grow over a 4-byte boundary, they are liable to be moved to the top of the HEAP – indeed they seem to move sometimes when they shrink as well! I have not seen any 'garbage collection' in BASIC 5, but I have seen instances where a string has been moved to a free area within the existing HEAP, so there is some re-use of storage.

Real Variables – On the BBC using BASIC 1 or 2, a real number is held in a 5 byte field as follows:

- +0 for 1 byte : Exponent plus &80 – i.e. &79 = -1, &80 = 0, &81 = +1

+1 for 4 bytes : Mantissa with MSB first, LSB last (opposite to Integers). The first bit of the first byte is the mantissa sign bit. Normalised, with an assumed 0.1 (binary) before mantissa. Positive number with sign (ie NOT 2's complement).

On the Archimedes using BASIC 5, a real number is held in a 5 byte field as follows:

+0 for 4 bytes : Mantissa with LSB first, MSB last (same as Integers). The first bit of the fourth byte is the mantissa sign bit. Normalised, with an assumed 0.1 (binary) before mantissa. Positive number with sign (ie NOT 2's complement).

+4 for 1 byte : Exponent plus &80 – i.e. &79 = -1, &80 = 0, &81 = +1

Zero is a special case, and is stored as 5 zero bytes in both cases.

Thus the 5 bytes are stored in the opposite order on the BBC and Archimedes, but the values of exponent and mantissa are the same.

These are minor changes, but are vital when either dumping storage, or writing machine code routines to access variables.

Martin Avison

• **ARM speed tests surprise** – I have, from long experience, found that, in general, the more instructions a program executes, the longer it takes. The corollary of this is that the fewer instructions, the less time it should take. However, while timing some very processor-intensive ARM code I was puzzled when on occasion I *removed* one instruction, and the program took *longer*! Also, using the program from Archive 2.6 p55 in March 1989 by Gerald Fitton for testing the ARM speed, I had run tests which, when repeated, gave different times! After much trial and error, I eventually modified Gerald's speed test program to illustrate the strange effect I had found.

The program ArmLoop is a simple piece of code which loops a set number of times. First, care is taken to ensure that the alignment of the code is to a 256-byte boundary. Then it repeatedly assembles and calls a piece of machine code which does 16 no-operation instructions (i.e. MOVNV),

Hints & Tips

loops one million times, then does 16 more no-ops. It also has a variable number of 4-byte offsets before the start of the code and a variable number of no-operation instructions in the loop. The times are displayed for each test for up to 10 4-byte offsets and up to 10 no-ops in the loop. When complete, a summary of the times is displayed.

The times show an expected increase in the time taken as the loop gets larger, but not always the expected increment for one extra instruction in the loop. As the offsets change of the start of the executed code, it would be expected that the times for the same loop size would remain constant. However, this is NOT true! There is a pattern which repeats itself every 16 bytes, or 4 word offsets, and the summary highlights with a red background the unusually long times.

Thus it can be seen that in some cases, *removing* an instruction from before such a loop can *increase* the time taken for the loop!

The conclusions reached after these tests were that for a branch instruction, every 16-byte boundary crossed by the Program Counter (which is 8 bytes ahead of the branch instruction) to its target, adds an extra 0.15 microseconds to the time taken – about the same time as a no-op instruction.

Making use of this to optimise program speed is difficult in a program with many branches, but the demonstration program includes at line 110 `speed = FALSE` : if this is changed to `speed = TRUE`, code is invoked in `FNspeedup` to ADD no-operations in before the loop to reduce the number of 16-byte boundaries crossed if possible. The execution times are reduced in 37% of the cases!

This is one little mystery demonstrated, but can anyone explain it? It surely makes the effects of relocating programs slightly unpredictable. Are there similar effects at any other memory boundaries? Has anyone got a comprehensive understanding of how long the ARM takes for various instructions – although it is supposed to execute one instruction per clock cycle, there are other effects on speed, like the size of operands for the MULTiply instruction, conditional execution etc.

```

10 REM > ArmLoop
20 MODE 12
30 PRINT "ArmLoop : Arm Loop Speed
      Testing Program      v5      Martin
                              Avison"

50 DIM code% 2000
60 REM align to page (256) boundary
70 code% = (code% OR &FF) +1
80 @% = &90A
90 PRINT "Base for code is at &"
      ~code%

110 speed = FALSE :REM <<<< change to
      TRUE to see speedup <<<<
120 loops% = 1000000 : REM number of
      loops
130 maxoff% = 10 :REM maximum offset
      applied
140 maxnop% = 10 :REM maximum no-ops
      in the loop
150 DIM time%(maxoff%,maxnop%)
160 PRINT "Number of loops = "loops%
170 PRINT "Detailed timings - Summary
      will follow at end"

180 PRINT "  Offset  Loop  Extra
      Start  Loop  Branch  Total "
190 PRINT "      "      noops  noops
      addr  addr  addr  time "
200 FOR noops% = 0 TO maxnop%
210   FOR off% = 0 TO maxoff%
220     PROCcall(code%+off%*4)
230   NEXT
240   PRINT
250 NEXT
270 PRINT "Summary of Total Times in
      Seconds ";
280 IF speed PRINT "with speedup" ELSE
      PRINT "without speedup"

290 PRINT "Noops";
300 @% = 5
310 FOR noops% = 0 TO maxnop%
320   PRINT noops%;
330 NEXT
350 PRINT "Offset"
360 FOR off% = 0 TO maxoff%
370   @% = &00005
380   COLOUR 128
390   PRINT off%;
400   @% = &20205
410   FOR noops% = 0 TO maxnop%
420     IF off% > 0 AND time%(off%,
      noops%) > time%(0,noops%)+2
      COLOUR 129 ELSE COLOUR 128
430     PRINT time%(off%,noops%)/100;
440   NEXT
450   COLOUR 128
460   PRINT

```

```

470 NEXT
480 END
490 =====
500 DEF PROCcall(code%)
510 PROCassemble(code%)
520 A% = loops%
530 TIME=0
540 CALL code%
550 time%=TIME
560 @% = &00008
570 PRINT off%,noops%,extra%,`code%
      ,`loop , `branch;

580 @% = &20208
590 PRINT time% /100
600 time%(off%,noops%) = time%
610 ENDPROC
630 DEF PROCassemble(code%)
640 extra% = 0
650 FOR opt=0 TO 2 STEP 2
660 P%=code%
670 [OPT opt
680 FNnop(16)
690 FNnop(extra%)
700 .loop
710 FNnop(noops%)
720 SUBS R0,R0,#1
730 FNsppedup("loop")
740 BGT loop
750 FNnop(16)
760 MOV PC,R14
770 ]
780 NEXT
790 ENDPROC
810 DEF FNnop(n%)
820 IF n% > 0 THEN
830 LOCAL I%
840 FOR I% = 1 TO n%
850 [OPT opt:MOVNV R0,R0:]
860 NEXT
870 ENDIF
880 =0
900 DEF FNsppedup(label$)
910 LOCAL label,1%,b%
920 branch = P%
930 label = EVAL(label$)
940 IF speed AND (opt AND 2) = 0 AND
      label < branch THEN
950 1% = (label) MOD 16/4
960 b% = (branch+8) MOD 16/4
970 IF 1% > b% THEN extra%=4 ATN1%
980 ENDIF
990 =0

```

Martin Avison

• **Cheat (revised) for Man-At-Arms** – Gets rid of the bug in the last cheat! This one gives you

infinite lives and punches!

```

10 *LOAD $.!MANATARMS.CASTLE2
      10000
20 *LOAD $.!MANATARMS.CASTLE3
      52000
30 ?&19198=0: ?&521F4=0
40 *SAVE $.!MANATARMS.CASTLE2
      10000 +10000 10000 10000
50 *SAVE $.!MANATARMS.CASTLE3
      52000 +1000 52000 52000

```

If you want to turn the game back into its original form change the two variables in line 30 to the value of 1. Mark Faulkner

• **Cheat for Pysanki** – This cheat gives you Infinite lives and missiles.

```

10 *LOAD $.!PYSANKI.PYSANKI2
      10000
20 *LOAD $.!PYSANKI.PYSANKI3
      52000
30 ?&19178=0: ?&52278=0
40 *SAVE $.!PYSANKI.PYSANKI2
      10000 +10000 10000 10000
50 *SAVE $.!PYSANKI.PYSANKI3
      52000 +1000 52000 52000

```

If you want to turn the game back into its original form, change the two variables in line 30 to the value of 1. Mark Faulkner

• **Cheat for Kaptain Konflikt** – This cheat gives you 160 grenades and infinite power!

```

*DIR !KONFLIKT
LOAD"NEWVERT"
LIST 1120
1120.Var_grenades:EQUd 160 (160
      - Number of grenades!)
LIST 6940
6940 REPEAT:!Var_man_shot=0:
      UNTIL !Var_lift_off=3
SAVE "NEWVERT"

```

Also, here are all the passwords (*backwards Ed.*) – ELBRAM, REKAEPS, CITATS, TCAPMI, ELIBOM. Mark Faulkner

• **Cheat for Alerion** – This cheat gives you infinite lives!

```

10 *LOAD $.!ALERION.G 1E06C
20 ?&2749C=0
30 *SAVE $.!ALERION.G 1E06C
      +226A4 26ABC

```


Hints & Tips

To convert the game to its original form change the value of the variable in line 20 the 1. Mark Faulkner

• **Cheat for Mad Professor Mariarti** – This cheat gives you infinite lives and energy. Edit the !RUN file in the !MadProf Directory with !EDIT. Then when you have it Edited look to see where it loads in the program 'Profprog'. Then just delete the code after it and add this code below :-

```
Load Profprog
Echo <21>
| Infinite energy
MemoryA 18F48 F0000000
MemoryA 1919C F0000000
MemoryA 1920C F0000000
MemoryA 19F00 F0000000
MemoryA 19F70 F0000000
MemoryA 186B4 F0000000
MemoryA 19B08 F0000000
MemoryA 1D260 F0000000
MemoryA 18D84 F0000000
| Infinite lives
MemoryA 196B4 F0000000
Echo <6>
Go
RMKILL Musicmodule
RMKill Joystick
RMKill Teqmodule
TequeRmMin
RMKill TequeMemory
FX 15 0
DIR ^
Echo Bye Bye professor!
```

Remember to keep a copy of the original !RUN file so you can return the game to its original form again.

• **Disc free space snag** – The RISC-OS desktop filer COUNT menu option provides a very useful way of checking the size of individual files, applications and whole directories (and any nested sub directories). However, it is somewhat economical with the truth.

You may well find that the *COUNT of a particular application or directory structure indicates that it will fit comfortably onto a floppy or RAM disc that you have already checked for *FREE space. However, when you try and copy the files across you may get a 'Disc full' error.

The reason is that *COUNT takes no account of the space occupied by the catalogues of directories themselves; this is 2k per directory on an ADFS or RAM disc. So a directory containing several applications, some perhaps with further sub directories, will take up a lot more space than the *COUNT option would have you believe.

Rick Sterry, Wakefield BBC Micro User Group

• **Fortran bug** – There is a bug in the DACOS (double precision arc-cosine) function on Fortran release 2. The function does not work if it is given a numeric, rather than algebraic, argument. Thus $PI = DACOS(-1.0D0)$ does not give a value of π as it should. To get π , you have to use $ANG = -1.0D0$ followed by $PI = DACOS(ANG)$ where ANG is any variable name you like. Raymond Wright, Guildford.

• **Keyboard cleaning** – I recently tried this after reading about it in Archive 3.9 p10. It was even easier than the magazine article suggested. Whilst I had the keyboard apart, I pulled off the key tops and gave them a gentle scrub with soap, warm water and a nail brush as they were getting grubby. I now have a gleaming keyboard that anyone could be proud of. David Livsey, Exeter.

• **PrinterDM with the LC24-10** – Here is something any one using an LC24-10 with new !PrinterDM (Ver 2.46) If you are getting banded graphics dumps and squashed text then make a copy of the Text file PrDataScr file found inside the application directory.

Load the copy in to !Edit and look at all the Epson LQ definitions for the line below.

```
line_epilogue: "<27>${<0><0><27>J
<24>"
```

Change all LQ definitions except the 60 by 60dpi to:-

```
line_epilogue: "<27>${<0><0><27>J
<28>"
```

this having been done, save the file.

Delete the data file PrData. You can either rename the changed text file to PrData and check all is OK before using the supplied compacting program (PrSquasher) or, if you are confident there are no mistakes, compact it ~~first~~ before trying it out.

If you still get banding or gaps appearing then adjust the value between the < > symbols of the last parameter. This may possibly work for the other drivers.

N.B. Remember to keep a copy of the original files.

Michael Overthrow

• **Rhapsody** – Before entering complex music, fill a dummy line with your shortest notes. Now everything just lines up, even across five staves, so you never have to 'nudge' notes to and fro. But why does the Rhapsody manual lack a tutorial? I had typed in many pages of sheet music before guessing how to set the key and the automatic sharps! Nik Kelly, Liverpool.

• **System modules versions** – I have heard of a number of applications refusing to work because one of the modules contained in the !System application folder was out of date. A quick way to check the version numbers, even if the modules are not already loaded, is to open up the '!System.Modules' directory (by double clicking on the '!System' folder icon while holding the <shift> key down), and then to load each module into !Edit. Ignore all the [00][00], etc you should look for the text below:

CLib – Shared C Library 3.50 (19 Jul 1989)

Colour – Colour Selector 0.52 (26 Apr 1989)

FPEmulator – FPEmulator 2.80 (22 Feb 1989)

These are the latest official version numbers. Acorn have stressed that any other other releases are illegal copies and cannot be relied on.

Rick Sterry, Wakefield BBC Micro User Group

• **Virus warning** – In a recent message on the international UNIX-based networks, in the eunet.micros.acorn section, a Liverpool-based Archimedes owner announced the discovery of a virus. The virus resides in the !Boot file of applications and consists of an extra line:

```
RMEnsure Extend 0 RMRun
      <Obey$Dir>.ModName
```

and is followed by a commented-out hex <FF> character.

The module name ModName varies between MonitorRM, CheckMod, ExtendRM, OSextend,

ColourRM, Fastmod, CodeRM, MemRM. The name of the module in the *MODULES list is always 'Extend' and is thus referred to as 'The Extend Virus'. The module doesn't do anything destructive but it is always possible that someone will modify it. The only present problem is that it takes 1k of RMA every time you double click on an application, eventually filling it up and crashing the machine. Of course, it also consumes sections of disc space, as it puts copies of the module and extended !Boot files on your discs, but this is pretty subtle and is likely to go unnoticed, (at first).

If an application doesn't have a !Boot file to start with, the virus creates one. If all this makes hard disc owners a little nervous then they should get hold of a copy of !Watchdog, which is on Risc User's program disc Vol 3 no 7.

Wakefield BBC Micro User Group

• **Wiping SCSI discs** – It's not often that you want to remove all the files from a hard disc but with the advent of removable hard drives, it is becoming a more common requirement. To select all the files and delete them can take a huge amount of time if there are a lot of small files so it would probably be quicker to re-format the drive. If you are using an Oak Solutions' SCSI interface then there is an even quicker way of doing it. Use their SCISForm program and choose the <M> option to initialise the map and root of the disc. This simply re-writes the catalogue of the root directory to say that there are no files left on the disc. This is obviously very quick – but deadly – beware, there's no way back.

Impression Hints and Tips

Here are a few more hints and tips mostly from the editor's dabblings in preparing the magazine...

• **Dashes** – If you, like me, don't like to see hyphens used where dashes should be used – i.e. in places like this – you will probably be sick and fed up of typing <alt-153>. (Note that the character in "alt-153" is a hyphen, just in case you weren't aware of the difference.) If you are importing text into Impression, occurrences of 'hyphen hyphen' will be converted automatically by Impression into a long dash — see what I

mean. Personally, I prefer the shorter one so what I have done is set up the abbreviation dictionary with 'expand as you type' and used an underline character to be turned into a dash. The only drawback is that it's OK for things like the dashes earlier in this paragraph, but if, for example, you use dashes in phone numbers, as 0603-766592, the abbreviation technique does not work and you are back to <alt-153>. Anyone any other ideas?

- **Find styles** – If you want to find a style, get up the find/replace box with <ctrl-f4> and then click in the menu box to the right of the Find box and select the style you are looking for. This will come up as, say, "{ "heading" }". Type an "@" after this – which stands for "any text" – and then press <return>. This will highlight the whole of the first piece of text with that style or effect. Unfortunately, the facility to replace that style with another style is not yet working. If you do want to do any search and replace on the style names, export the text, with styles, and then use another WP such as !Edit to do the searching and replacing before returning it to Impression.

- **Rogue effects** – Someone sent me a file in which they had used a particular font which I did not have so when I loaded the file, Impression told me it was changing it to Trinity.medium. I did an edit-style and looked at all the style definitions to no avail. Eventually, I realised that it must have been used as an effect, so how was I to find it and eliminate it or change it to some font I did possess? Because the font had been changed to Trinity.medium (i.e. the BaseStyle font) I could not pick it out with a visual scan so the first idea was to change the BaseStyle to, say, Zapf.Dingbats so that anything which was in a different font was obviously an effect or a style. Unfortunately, this didn't reveal the offending effect. At this point, I became convinced that I had a non-existent, un-removable effect, i.e. a bug in Impression. So I sent the offending file to CC who informed me that the particular effect WAS in the text and they also showed me how to locate it... as follows...

(Actually, the reason that I couldn't find the effect was that I had already gone through the document adding extra styles and had covered

this rogue font-change effect with a font-change style of my own. In other words, the style, because it was applied later than the effect, took precedence.)

- **Finding effects** – In the same way that you can find styles (see above) you can also find effects as long as you tell Impression that you want effects to be shown on the style menu. To do this, locate the file "UK" in the Impression "Resources" directory. Load it into !Edit and find "Cnfl:" and change it to "Cnfl:E" – that's a one, not a letter "I". Save the file and shut down and re-start Impression. You then will have effects on your style menus and search on {"effectname"}@, as explained above.

- **Fast search and replace** – There are a couple of very useful keyboard short-cuts not documented in the manual which speed up the search and replace. When the "text found" box is on screen, <ctrl-R> does a "Replace" and <ctrl-N> moves to the "Next".

- **Keyboard short-cuts** – Apart from the ones listed on pages 119ff of the Impression manual, here are a few more: (some are mentioned on the menu, but not in manual)

<ctrl-shift-D> go to chapter

<ctrl-shift-H> produces a bullet i.e. a "•".

<ctrl-shift-I> also produces a bullet i.e. a "•"!

<ctrl-shift-J> produces superscript

<ctrl-shift-K> produces subscript

<ctrl-shift-T> save text story

- **Page number justification problems** – Some of you may have had difficulty getting correct centring or right justification of page numbers on footers. This is corrected in version 2.09 – well, almost! The footers on right hand pages were wrong last month, when I was using version 2.05, (in fact I didn't even notice!) and the footers on the left hand pages *would have been* wrong this month (with 2.09) if I had not found a way round it. If you try to have left aligned page number with a right tabbed piece of text, the text suffers a left shift. I've solved it for now by splitting the footer text into two separate frames, one left aligned and the other right aligned. It's messy, but it works. **A**

As market leaders in SCSI drives for the Archimedes and A3000, Oak Solutions has earned an enviable reputation for quality and reliability.

The recent introduction of the Worra Winnie range has brought the price of our SCSI hard discs within the price range of users who previously would not have been able to consider adding a hard disc to their system.

Our bulk purchasing power allows us to bring you these drives at staggeringly low prices. And yet all drives are top quality units, manufactured and tested under a zero defect quality control regime to ensure the highest levels of quality and reliability and, of course, come with our 12 month 'no quibble' guarantee.

The drives fall into two distinct categories; internal drives for the 300 and 400 series Archimedes machines, and external drives for the A3000 series machines (and also for 300/400 series - please specify when ordering).

The drives are available in 20Mb, 45Mb, 80Mb, 100Mb and 200Mb sizes. All drives are high quality 3.5" devices manufactured by Seagate or Rodime.

Both internal and external drives have auto-parking heads, and access times of 40mS (24mS on the 80Mb drives, and 18mS on the 100Mb and 200Mb drives). All of the drives transfer data at between 600Kbytes per second and 1Mbyte per second, which is up to three times as fast as conventional ST506 hard discs.

The SCSI card gives great scope for future expansion, and can support a further three hard discs, as well as tape streamers, CDROMs and Magneto Optical drives.

Please specify type of computer when ordering.

Internal Drives for 300/400 series

20Mb	299.00
45Mb	399.00
80Mb	599.00
100Mb	795.00
200Mb	1195.00

External Drives for 300/400 series and A3000

20Mb	349.00
45Mb	449.00
80Mb	649.00
100Mb	845.00
200Mb	1245.00

Add £10 to cover P&P. Prices exclude VAT



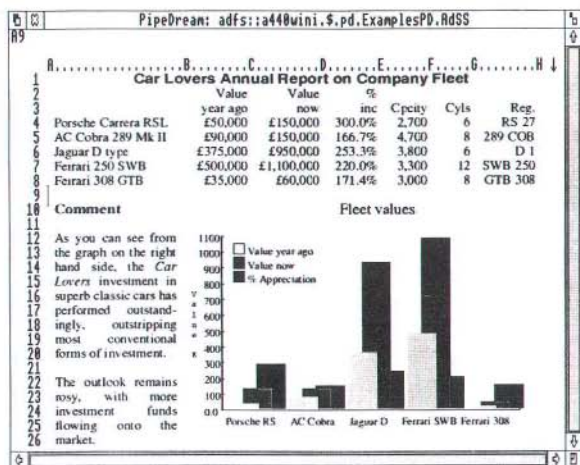
The Price Barrier is Broken

SCSI Hard Disc Drives With
Oak Solutions' 16 bit SCSI card
from only £299.00

Worra *Winnie*
by



PIPEDREAM 3



PipeDream 3 breaks down the barriers between word processor, spreadsheet and database. You can include numerical tables in your letters and reports, add paragraphs to your spreadsheets, and perform calculations within your databases.

Based on PipeDream 2, the best-selling integrated package for the Archimedes, PipeDream 3 has been completely re-written to take full advantage of RISC OS - if you can use RISC OS, you can use PipeDream 3. It is fully multi-tasking and multi-windowing, so you can work on many documents at once and instantly move information between them. And since PipeDream 3 can automatically load and save most popular file formats, including VIEW and First Word Plus, switching to it from other programs has never been easier.

Power, flexibility, speed, ease of use. PipeDream 3. Breaking down the barriers.

For a free brochure, see your Archimedes dealer, or phone us on 0954 211472 or return the coupon.

PipeDream 3 is for all Archimedes computers with RISC OS and 1Mbyte of RAM.

PipeDream 3 costs £147.00 + VAT.

Major features include:

- many documents loaded at once
- intuitive RISC OS user interface
- displaying and printing of pictures within text
- built-in 93,003 word spelling checker
- file compatibility with PC & Z88 PipeDream and BBC View Professional
- background recalculation
- keystroke compatibility with Z88 & PC PipeDream
- Z88 filing system
- automatic loading of VIEW, ViewSheet, Lotus, First Word Plus, Tab and CSV files
- automatic saving of VIEW, Lotus, Acorn DTP format, Tab and CSV files
- multi-field sorting
- use of all available fonts
- 62 spreadsheet functions
- external references for 3-D modelling
- macro file recorder
- slot protection

For a free brochure, complete and return this coupon

PipeDream 3 ☐ View Professional ☐

Name _____

Address _____

Post code _____

Colton Software, Broadway House, 149-151 St. Neots Road, Hardwick, Cambridge CB3 7QJ, England.

Fax: 0954 211607 Tel: 0954 211472

All trademarks acknowledged. The chart in the screen shown above was produced by sending numbers from PipeDream 3 to Lingenuity's Presenter 2 and then loading the resulting graph back into PipeDream 3.

Colton Software, Broadway House, 149-151 St. Neots Road, Hardwick, Cambridge, CB3 7QJ, England.

Fax. 0954 211607 Tel. 0954 211472

Comment Column

• **"Buyer beware"** – Here is a salutary tale with a (relatively) happy ending. Graham Collins, one of our subscribers, bought a 1M memory upgrade for his A3000 from Norwich Computer Services. Some time later (but less than a year) the computer started going wrong so he took it to Beebug Ltd from whom he had bought the computer. They took it in, fixed it for him and charged him £45. The trouble was that when Graham looked at the service report, he found they had "re-soldered loose connections on the ram board". He felt that this was unfair because the ram board was still under warranty. However, from Beebug's point of view, they had taken in a computer and repaired it in good faith and, indeed, had only charged £45 which is their minimum charge for repairing a computer. In one sense, because it was a fault on the ram board, it was Morley's responsibility, but why should they pay £45 since they could have repaired the board at very little cost to themselves. Should N.C.S. be responsible for the £45? Hardly, because all we did was supply a product from a third party. We do not feel that it is our responsibility to test the items that go through our hands.

So, who paid the £45? Well, no one, but Morley are going to upgrade the 1M to 3M and not charge Graham the full upgrade charge – well done, Morley.

What is the moral of this story? Should Beebug have informed Graham as soon as they found it was the memory upgrade that was at fault? Even if they had, they would presumably still have had to charge him their £45 minimum charge. I don't really think anyone is to blame but it does suggest that you need to be careful when combining hardware bought from different sources. The problem could have been avoided if Graham had taken the memory board out when the computer went wrong so he could see where the problem lay. Mind you, having said that, we have had memory boards returned to us apparently not working and then found that they worked OK on other computers. The problem lay with a timing fault such

that the tolerance of the customer's computer and the tolerance of the memory board meant that the two were incompatible. Buyer beware!

• **Canon BJ10e** – I've recently bought a Canon BJ10e from EFF who gave me very prompt service. The printer itself is quite petite, about the same size as an A4 pad, but thicker, weighing in at a paltry 1.8 kg. I ordered mine in the beige, there is also the option of having it in black, I suppose to co-ordinate it with the black lap tops around. As a result of the lightweight construction, the lid and some of the fixtures appear to be flimsy and I doubt whether they would stand up to the rigours of a commercial or educational environment.

The print quality is very good, the BJ10e uses a 36 x 48 dot matrix for text and up to 360 dpi for bit-mapped graphics. I have yet to use any proper 'inkjet' paper, which gives much better results. The most noticeable aspect of this printer, is that it is virtually silent! I also bought the sheet feeder, which takes about 30 sheets of A4, with a flap near the bottom for envelopes and thin card. The construction of it is also very plastic and the only problem that I have had with it, is that it has a thickness adjustment which needs to be set properly or else it ejects an extra sheet of blank paper after every printed sheet.

The printer manual does not give the full details of the control and escape codes, which are useful if you need to customise the First Word Plus driver for instance. It took me a long time to get it to work properly with the printer driver and First Word Plus. In my opinion the documentation sent out with the printer driver is inadequate. I have detailed my findings in the hope that it may help others.

BJ10e d.i.p. switch setup

1	2	3	4	5	6	7	8	9	10
on*	off	off	off	off	on	off	off	on	on

*only with an sheet feeder

*ignore is set to 0 on the Archimedes

This set up works equally well with First Word Plus and the printer driver. The RISC-OS printer

driver should be installed for all printing, including First Word Plus. I've also found that the margins need to be set, to show the correct printable area, for programs such as !Draw and these are:

Top: 0.2 mm	Bottom: 12.6 mm
Left: 0.0 mm	Right: 6.9 mm

Note that these values (should) hold true for all paper sizes, as they define the margin.

Even with the correct adjustment of the thickness control, I found the printer ejected an extra (blank) sheet after a graphics dump from !Draw and !Paint. It is more annoying than serious, however.

The running cost of the printer is dependent mainly on the type of paper you intend to use and the frequency of screendumps and the like. I am using standard 80 g/m photocopier paper, which costs about £7.00 for 500 sheets (ream). The ink cartridge/ head costs £20; I have printed about 600 sheets of mixed DTP and standard printer font outputs, where I have found the results beginning to 'band', noticeable with large expanses of black, although this hasn't seemed to affect normal or outline font print-outs. I estimate the cost per page to be about 4.5p, not too bad, if you can't afford or justify a laser printer.

Newsflash – Canon have decided to drop the price and include the sheetfeeder for free. I have seen prices as low as £320 inclusive; check out the computer magazines for up-to-date prices. I paid £420 for mine, so at £320, it's very good value in my opinion. Chun Wong, Sheffield.

• **Dealer Problems** – I was interested to read David Hazel's letter, in the November issue, regarding dealer problems and Acorn computers. Now that Acorn have "sold on" the development of their RISC technology to the newly formed ARM company, their dependence on the sales and marketing of high quality products is even more significant for all users.

As a representative of one of Acorn's biggest single group of customers, I can suggest several issues which they might like to consider.

Generally, we are satisfied with the service that our dealers offer. Equally, we are delighted with the performance of the machines themselves and

we are confident that we have made the right decision in encouraging our schools to buy RISC technology. However, there are difficulties with the "peripherals" supplied with the machine which create a lot of extra work for dealers and other support agencies, such as our Microtechnology Centre, which are often unnecessary and reflect Acorn's inability to perceive the problems of ordinary end users no matter how trivial they may be to more technically proficient users.

For example, the Applications Discs do not contain the latest printer drivers (which makes programs such as Draw or Folio much slower to print and therefore much less attractive) and contain no copies of the Integrex or Laserjet drivers. In addition, they are structured in a such a way that it is impossible to just "switch on and go". Problems arise with incomprehensible messages about !System and modules (whatever they may be), an apparent lack of memory (e.g. copies of First Word Plus with no maximum wimp slot size), a small or non-existent font cache, an obsolete font system, apparently endless disc swaps when saving or copying files (even from a RAM disc) or loading programs from a new disc which has not had the necessary extras, such as !System and !Fonts added to it (and sometimes even when they have been) and printers which print gobbledegook because the drivers are not configured correctly. Whilst answers to some of these problems may be found in the guides, there is no starter booklet which provides immediate help with these sort of problems. They are the ones which arise as soon as the user is familiar with the environment itself. In addition, having run an educational hotline, Acorn now refuse to answer (as in "we know but we won't tell you") schools' questions when contacted. You can imagine the reaction to that from schools which have bought anything up to 120 Archimedes!

Whilst we offer a very full support service for our schools which will help them solve these and, hopefully, all the other problems which may arise, Acorn themselves could make life a lot easier for us and our dealers and give greater customer satisfaction for all users if thought more carefully about these potential user difficulties.

For example, they could provide much more carefully structured Applications discs and produced a Beginners' Guide with the machine, dealing with just these sort of issues. I suspect the source material exists in many LEAs already. Another useful addition might be fact sheets with answers to the other more commonly asked questions, from the days when they did run an educational hotline for schools, which could be supplied on request and made available to support agencies for duplication and distribution.

With regard to the outline font manager, it should be made available with the machine or, at least, Acorn should supply more information with the machine about this most essential upgrade. At present, end users are paying for it over and over again within the cost of each program they buy which provides it; something that is also unfair on the software houses themselves.

Acorn may claim that they are now listening to customers but the fact is that we and many others have been saying these sort of things for what seems a very long time.

I suspect that a major new market which is opening up, consists of those potential customers (usually computer illiterate from a non games playing background) who have never bothered with computers before but are now encouraged to the view that, maybe, they are worth considering after all. The critical factor for the users is not the speed of the machine, the quality of the graphics, the relative merits of different items of software or even small price differences. It is the simplicity with which they can get started on useful tasks such as word processing and drawing. At present, on Acorn computers, it is not as simple as it could be for reasons that are nothing to do with the machine itself but everything to do with a lack of consideration for the requirements of this sort of end user.

Finally, if Acorn want a suggestion for a technical development, useful for the (majority of) users who do not have a hard-disc, they should look at ways of increasing the storage capacity of their floppy drives to 1.2mb.

Martyn Wilson, Inspector for Technology, Hampshire LEA

• **Joystick interfaces** – RTFM kindly rang from Jersey to say that although their Joystick interface voids the A3000's warranty, it does not void the warranty on the A400/1 series. I dislike internal 'dongles', so I admitted I'd already bought one from for their rival.

The Serial Port's gadget is packed into a neat breakout box with Archimedes and printer sockets at the ends, two joystick 9-pin D-types and a printer / games switch on top. My stiff printer cable pulled it off the Archimedes, so I made a half-metre ribbon cable to bring it to my desk at front-left.

Their Tutor program prompted for stick actions and each matching keystroke and made a command file for the joystick Rmodule. Their compiler took text-files with simple keywords for stick actions, flags and logic. Examples ranged from Alerion to Zarch.

The Rmodule stayed active through games, BAS-IC and Rhapsody. My early version lacks <shift-Fn>, <ctrl-Fn> and <shift-ctrl-Fn>, as used in View, Edit or Rhapsody, but took all the regular keys.

It's fun. It's also given me 10 switches without fuss or I/O podule. I'm building a low-tech 'Knob-box' for it, with <x>, <y>, <z> look_> _shift and 3 bits to select Eye or 1-6 objects. (*I reproduce this last sentence in the hope that it means something to someone! Ed.*) Nik Kelly, Liverpool.

• **Schema** – Just a brief note on this acclaimed spreadsheet. A friend, who has just bought Schema, invited me to try it on his A440. My first reaction to its speed, presentation and the facilities, such as functions and macros, was that it was an excellent program. However, I very quickly found a glaring bug:

Inserting extra rows and/or columns in the middle of an existing sheet results in replicated formulae having 'holes' in the new parts and incorrect references after the insertions.

I then found that changing a column of figures on a 'what if' basis resulted in formulae being changed into text and hence failing to recalculate. My trial run was done on a very simple sheet so changing the text back was very easy but it

should not be necessary. The person whose machine and program I was using has to work with real and sometimes very large spreadsheets – correcting formulae is not on for him!

I have used PC packages such as Lotus 1-2-3 and Symphony, to name but half a dozen, so I have a fair idea what these things should do. I know that the above named products cost about three times as much as Schema but there are some which cost only half, such as Quattro, which can at least give a guide to the standards expected.

Having said all that, I did like Schema and will consider buying it when the above mentioned faults have been corrected. I would also ask the writer(s) of the program if they can arrange for only the marked block to be printed without the column letters and row numbers. One thing I would like to see in a spreadsheet is the ability to select only a few, non adjacent, rows for printing (or perhaps I missed how to do that in the short time I had for play!). Dave Livsey, Exeter.

I passed these comments on to Dave Clare who told us they were aware of the problems and that they will be cured in the next release of Schema which will be supplied to all registered users free of charge (Minerva, are you listening?). Also, they only occur after inserting new rows or columns and copying into that area, not if you copy or move a block of data or formulae. The point about printing labels is already catered for – <shift-f7> turns off labels and <shift-f6> turns off the grid as explained in the manual and shown on the Default menu of the main Schema Sheet menu. Dave Livsey's last point is being taken into account for future releases of Schema. For the moment, the only way is to copy the relevant areas to a blank part of the sheet and print the marked block. Ed.

• **Musical Macs** – I would like to pick up on a point raised by Brian Cowan in his Hardware Column (Issue 4.5 p22) where he states that, in his view, since the advent of Impression 2, there is no need for Archimedes owners to feel envious of Mac owners. This may be true of DTP but, unlike the Archimedes, the Mac has excellent support for musical applications, particularly professional Midi sequencing and direct to hard disc audio recording.

With the release (at last) of Inspiration, Pandora's excellent Midi sequencer, (I disagreed with the poor review it got in Risc User – and with the fact that they thought Studio 24 Plus was good.) we now have a sequencer which competes with the best on the Mac. There are still a few features missing, though those it has are well implemented. It has very powerful editing facilities, though it has no scorewriting abilities. However, because it saves its files in the Midi Files Standard, as does Rhapsody, it should, in theory, be possible to use Rhapsody and Inspiration together.

However, it is the hardware support that puts the Mac far ahead of the current Archimedes situation. For example, Digidesign's 'SoundTools' expansion card for the Mac provides CD quality sampling and playback (much like Armadillo's A616). However, SoundTools has on-board memory and intelligence enabling it to get on with the business of sampling/playback whilst the host Mac can be running a Midi Sequencer, which in turn can instruct SoundTools as to which samples to play, and when. The multi-tasking Archimedes cannot do this – the A616 takes over the Archimedes as a single task, preoccupying the processor and using the main memory.

Then there are DSP cards. A Digital Signal Processing chip is a very fast number cruncher (some are rated as high as 80 MIPs) dedicated to... processing signals. They can do all sorts of things to digitised sound (time delays, pitch changing, dynamic control, digital filtering, etc), all in real time.

For people who still think that 4 MIPs is fast, Symetrix claim that their recently launched DPR-44 4-track digital recording and editing system uses a processor running at 400 MIPs! It won't be cheap, though.

(Incidentally, for those of you still wary of dongles, I have two dongles dangling off the back of my 410 – Impression and Inspiration – and have not experienced any problems so far.)

The prospect of a Mac emulator sounds interesting, though you'd need a pretty hefty ARM to emulate a 25MHz 68030 Mac 2. However, if you could also hook up Mac Nubus expansion cards...

I am not particularly impressed with emulators in general. You get accustomed to the native speed of any machine and emulation of other environments will always be slower than native mode operation.

I've had an Archimedes now for three years and, as a programmer's machine, I still think it's the bee's knees but I'd like to see the Archimedes take on the Mac market in the music field the way that it has in the DTP field. David Lenthal.

• **Starfleet encounter** – Alan Highet gave a very unfavourable impression of the program which was, I think, a bit unfair. (*The author of the program writes.*)

Alan criticises the lack of a 'one player versus the computer' option. It results from the complexity of the gameplay which makes it quite difficult (impossible?) to implement a good computer opponent. In any case, isn't it nicer to play with a fellow human being? Starfleet Encounter has been designed to administrate the gameplay; you can regard it as a kind of board game with a computerized referee and that's how you have to judge it – even if there is an arcade action part.

Alan's next point of criticism is that the players can't hide their plans from the opponent. This is not really true. The facility to execute pre-programmed command macros is one mechanism to do so (these sequences can be written before the players meet and can then be loaded in). Secondly, who can deny that chess-players, for example, can hide their plans from each other?

That Alan doesn't like the method of programming the ships, is no surprise to me. It really is somewhat difficult! This may be true if you make use of all the programming features (functions, if-else-endif, variables) but restrict yourself to the basic facilities and it's absolutely simple.

Finally, it is obvious that the simultaneous use of the keyboard by two persons is not ideal, but how can Alan say it doesn't work? I play Starfleet Encounter quite often and I can assure you: it works! Starfleet Encounter is available for £10, sent in by cheque to Daniel Tamberg Software, Landgrafenstr. 9, 1000 Berlin 30, Germany. This includes a 28K on-disc manual and several example sequences. Daniel Tamberg, Berlin. **A**

A RANGE OF HIGH QUALITY OUTLINE FONTS FOR ONLY £1.50 EACH.

The fonts work with the Acorn Font Manager, supplied with all DTP programs. Once installed they can be used with many more programs including Draw and Genesis. Full hinting gives elegant shapes at any size.

DESIGN CONCEPT,
30 SOUTH OSWALD ROAD,
EDINBURGH EH9 2HG

Design
Concept

ACROPOLIS
Ainslie
CELTIC
HOBART
KHUT
LED
SPARTA
SUBWAY

also available are a variety of dtp tools: **shade** uses a sequence of COLOURS to fill a box. **!FREEHAND** allows CARTOONS OR EVEN HANDWRITING TO BE SAVED AS DRAWFILES. **!fontLIST** Lets you PRINT examples of each font.

PRICES:
FONTS: £1.50 each
Carriage: £2

The Complete Upgrade Solution



- Uses only eight RAM devices
 - User upgradeable from 1 to 4 Mb
 - Four layer printed circuit board
 - Low power consumption
 - Available without RAM devices
- Bare card - £46 2nd Mb - £79 4th Mb - £199**



- Increases resolution with all Multiscan monitors
 - Doubles desktop work area
 - Custom modes for Taxan and Eizo monitors
 - Suitable for all Archimedes computers
 - RISC OS mode generator available separately
- Atomwide VIDC Enhancer - £35**



- Includes MEMC1a upgrade
 - Upgradeable from 2nd to 4th Mb
 - Large capacity OS ROM sockets
 - No soldering required
 - Four layer printed circuit boards
 - Courier collection of your machine
- 2nd Mb - £340 4th Mb - £520 2 to 4 Mb £207**



- New series Aleph One ARM3
 - 3 to 4 times performance increase
 - Surface mount technology
 - Four layer printed circuit board
 - Courier collection of your machine
- ARM 3 upgrade - £495**



- Uses only eight RAM devices
 - Suitable for A440, A400/1 & R140
 - Fully RISC OS compatible
 - Four layer printed circuit boards
 - Courier collection of your machine
- 8 Mb upgrade - £860**



- All products are cross-compatible
 - Combination deals available on all products
 - Typical combination A310 4 Mb and ARM3 £950
 - Dealer enquires welcome
 - Phone for full details on all products
- All prices include VAT at 15%**

ATOMWIDE

23 The Greenway Orpington Kent BR5 2AY Tel 0689 838852 Fax 0689 896088



Gerald Fitton

Thanks once again to all who have written to me. As I write, I have half a dozen discs which I have not yet returned; they will be returned as soon as possible. You are getting more ambitious in your uses of PipeDream and the quality of the applications which you send me are excellent. This increased complexity means that it takes me a bit longer to understand exactly what you have done and, consequently, there is a delay in returning your disc to you – especially since I give priority to letters asking for help.

Schema vs PipeDream

I have been sent spreadsheet benchmark comparisons between V 3.14 of PipeDream and V 1.03 of Schema. I don't have Schema myself so I am unable to test out the claims but they come from a source I believe to be honest. Possibly a new version of Schema has been issued since the tests were done so these figures may be out of date, however, here are some of the results.

Pipedream is about five times faster at manual recalculation. PipeDream loads its own format files in about two thirds of the time Schema takes for its internal format files. Both will load the universal CSV files but Schema takes about 20 to 30 times longer to do so. PipeDream is about four times faster than Schema when scrolling around the spreadsheet. Printing from PipeDream is 2 to 3 times faster than Schema. PipeDream uses about half the memory that Schema does and PipeDream uses memory dynamically (it gives up what it doesn't need). Schema sorts in about the same time as PipeDream but PipeDream updates cell references whilst sorting. The version of Schema tested has a bug in the 'Insert row'; this bug causes cell references to be upgraded incorrectly.

Of course, I'm sure that Schema will be upgraded and will improve its performance. It does have some facilities such as built in charts that PipeDream handles another way (e.g. by exporting data as CSV files to, say, Presenter or GraphBox). Against that, PipeDream is more than just a spreadsheet and has many facilities that Schema

doesn't. I think it unlikely that anyone with PipeDream will want to add Schema to their range of packages. If you have a different opinion or if you have benchmarks which contradict the figures I have quoted then please write to me so that I can present the other side of the story.

PipeDream on the Z88

Since I mentioned that I have a Z88, I have received half a dozen letters specifically about linking the Archimedes to the Z88. Perhaps the forum for such comment is through the PipeDream User Group. The Pipedream User Group has a Newsletter and provides some technical support. Write to me (at Abacus Training – address on the back inside cover) if you're interested in joining.

Transferring files

PipeDream 1 was View Professional on the BBC Micro and was called PipeDream on the Z88. View Professional came first and was written by Mark Colton in 6502 code (the CPU of the BBC Micro). Mark translated this program into Z80 code for the Cambridge Z88. Robert Macmillan (with others) re-wrote the code in the high level C language and compiled it for use under MS-DOS (for the PC range) and Arthur; this version became known as PipeDream 2. PipeDream 3 is the multitasking, RISC-OS version and was released at the Acorn User show on 21st August 1989; I am told that the master disc was 'minted' at 6 am that day! All versions of PipeDream are upgrade compatible, so you can safely create a PipeDream file on a Z88 or in View Professional knowing that it will run on a PC under MS-DOS or on the Archimedes. PipeDream files created on a PC under MS-DOS will run on the Archimedes under RISC-OS.

You have to be a bit more careful working backwards from the Archimedes to the Z88 or to a PC because there are some features available in PipeDream 3 on the Archimedes that are absent from PipeDream 1 or 2 but, so long as you are careful, your formulae will work. Of course, text files in the system font have no downward compatibility problems.

Manual recalculation

Some sheets or databases with many functions littering the document are of the type where you need a lot of data entry before you need the result of a recalculation. As an example, I add about a dozen names and addresses to the PipeLine database at a time before printing labels etc. If you use <ctrl-FO> and change the recalculation from auto to manual, you will find that this speeds up data entry. Of course, you can change it back or use <ctrl-A> to force a recalculation when you've finished.

Mode 0

If you drop into mode 0 before doing a massive sort operation then you will save about 20% of the sort time.

Default colours

The bug, 'Incorrect number of output bits - printing cancelled' will materialise if you use a different colour scheme from the PipeDream default. I have now been asked what the default colours are by some of you who have lost the original somewhere! Use <ctrl-FR> and then, from the top, the colours are 7, 0, 2, 11, 14, 11, 4. It seems that it is the background colour which causes the problem rather than the other colours (but you might know better!) so make sure you use the default.

Printing sprites

An earlier bug was that PipeDream would not print sprites correctly from non square pixel modes (see Maurice Edmundson's article in the May 1990 Archive). This has been fixed sometime around version 3.1. I am still getting letters from people with this problem who have not yet upgraded. If you have a version earlier than 3.10, you should upgrade. If you have 3.10 or later then there is no urgency about upgrading; the latest version is 3.14.

StartUp

PipeDream is a wonderfully integrated package which can be used as a wordprocessor, spreadsheet and database all within the same document. Because it can do all these things at once, its versatility makes setting up a document seem more complicated than it really is.

If what you want to do in one document is mainly word-processing with a few of the spreadsheet facilities included, it is better to set the file-options differently from one which is to be used mainly as a spreadsheet. In particular, unnecessary difficulties about such things as whether cells expect their first entry to be left aligned text or right aligned numerical values arise because the file-options have been inappropriately set.

Almost any set of options can be preset by using a macro - but it is unfortunate for the beginner that macros are a PipeDream facility best tackled later rather than earlier in the learning process. Robert Macmillan has provided a couple of macros for the Archive monthly disc (also on the April 1991 PipeLine disc), one where the options are more suited to a Spreadsheet (called new_sheet) and one more suited to a wordprocessor (called new_word). To run a macro, all you need to do is double click <select> on the macro and it will run, carrying out all its functions. Try the new_word macro and you will have a 'default' word processor document. Double click on new_sheet and you will have a default spreadsheet. You may then change the options further if you wish but you will not be able to save your new option set as a changed new_word or new_sheet macro. To change the macro you need to learn a range of 'Editing macro' skills.

You may have a particular requirement for a 'startup macro' which uses a set of file-options that you like but, as yet, you haven't the skill to write it. If so, send me a formatted disc (plus return postage and a self addressed sticky label) with an example file, set up as you want it, and I'll send you back the disc with a macro that will do the job for you.

Iteration

Malcolm Brown has sent me an interesting example of iteration which he has used to solve a financial problem. The problem is to calculate the size of loan repayments (e.g. hire purchase payments) knowing the size of the loan, the interest rate and the repayment period. It is on the Archive monthly disc and will be on the April 1991 PipeLine disc. PipeDream does have financial functions (have a look at pages 157 to 160 of

the User Guide) which could have been used to solve Malcolm's problem more elegantly. However, I like his solution because I believe it to be an example of the use of PipeDream's iteration facility which is neither too simple to be useful nor too difficult to understand what is happening.

Generally, mathematicians use iteration only if a formula contains the wanted variable 'implicitly' in such a way that the formula can not be 'inverted' (solved) to obtain an 'explicit' solution for the wanted variable. Quadratic equations can be solved 'explicitly' but quintics (fifth power equations) and many 'real life' mathematical problems can not. If you send me a solution to Malcolm's 'Amortisation Annuity' problem using PipeDream's built in financial functions, I will include it on one of the quarterly PipeLine discs (and you will get a free PipeLine disc or a refund if you've paid already). The financial functions of PipeDream will allow you to create a 'repayment schedule' (showing just how much is still owed at any time).

Overseas PipeLine charges

Many of you have an annual subscription to the quarterly PipeLine series which 'runs out' with the April 1991 disc. The UK renewal is £18 and, to make it easy to calculate, I've decided that all overseas renewals will be £20. The extra £2 covers postage to the EC and, since I enjoy communicating with distant lands, I think I'll subsidise subscribers that are further away.

April 1991 PipeLine disc

Many of you have written in approving of the review on the January 1991 PipeLine disc which demonstrated how !FontFX could be used with !Draw to illustrate a PipeDream document. Recently, I have been having trouble using Acorn's !Draw to create my illustrations because I added a lot more fonts to my !Fonts directory. Now I have an answer to the problem - !Draw1½. This is available on Shareware 34 and on the April 1991 PipeLine disc. !Draw1½ has all the features of !Draw and many more. An explanation of how it works, illustrations of some of its features and how well it integrates with PipeDream will be included. !Draw1½, unlike Acorn's !Draw and the current version of Poster, will accept more than 100 fonts.

Puzzles

Another item on the January 1991 PipeLine disc which has been well received is the Puzzles. If you have one which you would like to contribute then, if it is suitable, I shall be most pleased to include it on a PipeLine disc.

Interword files

Help! Does anyone know the best way or have any advice about importing Interword files into PipeDream?

Amstrad CPC and PCW

Help! Has anyone any advice on serial port transfer of ASCII text from Locoscript on an Amstrad to PipeDream?

In conclusion

Thank you for all your contributions. Please be patient if you don't get an instant reply. Abacus Training is not my full-time job (even though my wife might say differently!); I teach a whole range of different subjects at the local College of Further Education. So you see, I have to fit PipeLine enquiries into the cracks between my College duties! **A**

Contact Box

- **Austrian Archimedes User Group** will they hold their next meeting in Vienna on March 22nd. For details, contact Mr T Halbritter, Laa 1, A-3040 Neulengbach. Phone 02772-4654 (home) or 0222-80125-232 (office).
- **Glossop Computer Club** meets every Monday at Oddfellows Hall, 69 High Street West and has a very strong Archimedes contingent. For details, contact John Dearn on 0457-862743 or Alan Crofton on 061-436-4658.
- **Wakefield BBC User Group** has meetings which are relevant to Archimedes on 3rd April, 1st May and 3rd July at Holmfild House, Thornes Park, Wakefield. Details from Chris Hughes on 0924-379778 or Rick Sterry on 0924-255515.
- **Warrington** - Any Archimedes users or user groups, please contact Robin Melling, 80 Severn Road, Culcheth, Warrington WA3 5EB. **A**

!Personal Accounts

A3000/Arc Special Edition

Version 2 : £28.95

- * RiscOS Multi-Tasking Application
- * 28 Automatic Standing Orders/Any Period
- * 48 Income/Payment Headings with budget columns
- * 10 Bank/Credit/Cash Accounts on-line
- * 20 Quick Entry Pre-sets
- * 3000 Entries per File
- * 50 Character Description Space
- * Full Scrolling Entries for easy input/edit/search
- * Reports to Screen/Printer/File
- * Calculator/Note Pad/Autosave & Much More

"Personal Accounts is very powerful, good value for money, easy to use and comes highly recommended"

Review of Version 1, Archive, November 1990

Apricote Studios

2 Purls Bridge Farm, Manea, Cambs, PE15 0ND



Tel: 035 478 432



Coroutines in C

David McQuillan

Coroutines can be a powerful programming technique and I shall show how to implement them in Acorn ANSI C.

"Hmm, yes it seems like it'll be OK. It would be much better if it had nested *include* files and macros in the input. Could you put a header with a page number on each page output?"

If you have done any amount of programming you know the problem. It would be easy to write the input if it called the main program passing each new line. The output would be easy if it called the main program to get each line. However, they both have to be subroutines of the main program – it seems like it is time for a whole raft of extra static variables or structures containing state variables to be held between calls. As more facilities go in, it all becomes more and more rickety, unintelligible and error prone.

Coroutines to the rescue

Coroutines enable you to write a subroutine as if it were the main routine. The implementation here works only with Acorn ANSI C release 3, not release 2. I don't know what changes Beebug ISO C would need. I do know of one machine on which coroutines are quite impossible without rewriting the operating system but, normally, the concept can be implemented fairly easily using assembler.

Another major use for coroutines is to implement simulations. There is a famous example by Knuth in his book 'Fundamental Algorithms', in which he simulates the elevator system in the California Institute of Technology.

Coroutines are built into Simula and BCPL and, implicitly, into Smalltalk and Lisp – especially the Scheme dialect.

Program description

The program has two coroutines, input and output, which call each other. The main line does nothing except set it all in motion. The input coroutine generates the fibonacci numbers and the output coroutine prints each number and how

much more it is than the last number. It is all fairly simple to do otherwise, coroutines only prove themselves when the going gets rough.

A coroutine is called by calling *co_resume* passing a pointer to a coroutine structure and a value. The coroutine called will return from a *co_resume* call it has made previously and the value will be the return value. Each coroutine executes on its own stack. The implementation here has void * type values so structures can be passed from coroutine to coroutine.

There is a little question as to which coroutine it is best to start first. I prefer a demand driven approach starting the output and then requesting data with NULL indicating the end of data. However, it is just as reasonable to follow a data driven approach, starting the input and pushing the data to the output. This is just an example of how democratic coroutines can be.

The main program does all the setup. *co_initialise* must be called once at the beginning so the main program can be thought of as a coroutine. *co_create* must be called for every other coroutine. The stack size should be set to some reasonable figure that I can't advise on easily, 560 bytes are added by *co_create* for a chunk at the base of each stack.

The first call to *co_resume* for a coroutine passes the parameter as a straightforward parameter to the associated procedure. Every subsequent call returns from a *co_resume* call within the coroutine. An error is generated if any coroutine tries to do a straightforward return.

So there you are, $E=mc^2$ and don't blame me if it all blows up.

```
/* > coroutine
 *
 * An example of coroutines.
 *
 * Works on Acorn ANSI C version 3.
 * Does not work with ANSI C
 *           version 2 - tried and
 * it looks hard without using
 *                           assembler.
```

```
* Don't know what's needed for Beebug ISO C.
*
* Code is very non-portable.
*
* No responsibility accepted if you come a cropper using
* the code. In particular I have not tried stack extension
* and interrupts with it.
*
* (c) put in Public Domain by David McQuillan Jan 1991
*/

#include <setjmp.h>
#include <stdio.h>
#include <stdlib.h>
#include <string.h>

/* coroutine header */

typedef struct {env ;
               int  *stack;
               } coroutine_t;

typedef void co_procedure_t(void *parameter);

void co_initialise(coroutine_t *coroutine);
void co_create(coroutine_t *coroutine, size_t stack_size, co_procedure_t
                                                       *proc);
void *co_resume(coroutine_t *coroutine, void *parameter);

/*****
/* start of example program */

static coroutine_t main_coroutine, input_coroutine, output_coroutine;
static co_procedure_t input, output;

/* main routine creating + controlling */
int main(void)
{printf("main\n") ;
  co_initialise(&main_coroutine);
  co_create(&input_coroutine, 2000, &input);
  co_create(&output_coroutine, 2000, &output);
  co_resume(&output_coroutine, NULL);
  printf("end main\n");

  return 0;
}

/* input coroutine */
static void input(void *parameter)
{i0 , i1, i2;
```



```

printf("input generates fibonacci < 100\n");

i1 = 0;
printf("input initial %d\n", i1);
co_resume(&output_coroutine, &i1);
for (i2 = 1; i2 < 100; i0=i1, i1=i2, i2=i0+i1)
{ %d\n" , i2);
    co_resume(&output_coroutine, &i2);
}

co_resume(&output_coroutine, NULL);
}

/* output coroutine */

static void output(void *parameter)
{ *value ;

    printf("output number, difference from last\n");

    if ((value = co_resume(&input_coroutine, NULL)) != NULL)
    { last = *value;
      int this;

      printf("output initial %d\n", last);

      while ((value = co_resume (&input_coroutine, NULL)) != NULL)
      { = *value;

          printf("output %d %d\n", this, this-last);
          last = this;
      }
    }
    co_resume(&main_coroutine, NULL);
}

/* end of example program */
/*****

/*
 * Library routines for coroutine_t objects.
 */

/* _kernel stuff */

#define STACK_DISP 0x230
#define JMP_SL 8
#define JMP_FP 6
#define JMP_SP 7
#define JMP_LR 9

```

Coroutines in C

```
#define V3_FP_MASK 0x80000000
#define SC_NEXT 1
#define SC_PREV 2
#define SC_SIZE 3

/* Resume a coroutine. */
/* coroutine may be current coroutine */

static coroutine_t *co_current = NULL;
static void *co_parameter = NULL;

void *co_resume(coroutine_t *coroutine, void *parameter)
{ (setjmp(co_current->env) == 0)
  { = coroutine;
    co_parameter = parameter;
    longjmp(co_current->env, 1);
  }
  return co_parameter;
}

/* Initialise coroutine handling */
/* Establish the 'mainline' coroutine */

void co_initialise(coroutine_t *coroutine)
{ setjmp(coroutine->env) ;
  coroutine->stack = (int *) (coroutine->env[JMP_SL]-STACK_DISP);
  co_current = coroutine;
}

/* coroutine starter for co_create */
static coroutine_t *co_starter;
static co_procedure_t *co_start_proc;

static void co_start(void)
{ *proc = co_start_proc;
  (*proc)(co_resume(co_starter, NULL));
  fprintf(stderr, "Exit from coroutine\n");
  exit(1);
}

/* Create coroutine and start executing. */
void co_create(
  coroutine_t *coroutine,
  size_t stack_size,
  co_procedure_t *proc )
{ *stack ;

  /* Put STACK_DISP space at beginning of stack */
  /* Do some trial+error initialisation! */

  if ((stack = (int *)malloc(STACK_DISP+stack_size)) == NULL)
```



```

{fails\n" ) ;
    exit(1);
}

memcpy(stack, co_current->stack, STACK_DISP);

stack[SC_NEXT] = NULL;
stack[SC_PREV] = NULL;
stack[SC_SIZE] = (int)(STACK_DISP+stack_size);

setjmp(coroutine->env);
coroutine->env[JMP_SL] = (int) stack+STACK_DISP;
coroutine->env[JMP_SP] = (int) stack+STACK_DISP+stack_size;
coroutine->env[JMP_LR] = (int)co_start;
coroutine->stack = stack;

co_start_proc = proc;

co_starter = co_current;
co_resume(coroutine, NULL);
}

```

A

ATTENTION ALL GAMES PLAYERS!

Do you wish that you could use a standard Joystick on the Archimedes?
Now you can.....

The Joystick Interface from The Serial Port

- The Joystick Interface plugs into the parallel printer port - a switch selects the joysticks or printer.
- No special support is necessary for The Joystick Interface so it will work with virtually any game.
- It comes complete with simple to use software that allows it to mimic key presses and includes control modules for many existing games. It can even mimic the mouse!
- Also supplied is a programming language that allows more complex modules to be created.

All major new games releases - including those from The Fourth Dimension, Minerva, Krysalis, Eclipse, CIS and others - will work with our interface.

"...when I was given this device, I was very sceptical - but it all works...in the vast majority of cases the thing will work, and work very well."

Computer Shopper February 1991

"The programming language and the compiler enables the joystick....to be used to control virtually any piece of software. Since the RTFM interface does not do this, The Serial Port's effort is the best buy of the two."

Acorn User February 1991

Available for only £23.95 exc VAT & P+P from most good dealers or direct from ourselves

The Serial Port Burcott Manor Wells Somerset BA5 1NH
Tel: 0243 531194 Fax: 0243 531196



Language Column

David Wild

I was very interested to see the reports of new languages in the February issue of *Archive* but rather disappointed to see that Acorn have removed several from their list. While arguing about which language is best is unlikely to be profitable, there can be no doubt that the availability of a variety of languages helps to retain the interest of the computer users and, eventually, lead to progress.

It isn't always easy to see why anyone should want to use any particular language against another. The drive to invent Forth, for instance, came from the need to write programs to control the movements of a telescope. The particular technology meant that concise programs were needed, but most people didn't want to learn machine code. It may be that the decline in interest in Forth over the past few years has come because of the easy availability of compilers on micro-computers.

Faced with a choice of BASIC, 'C', Pascal and Fortran as a minimum, we tend to forget just how recent this situation is. Five years ago, I was working with a project planning program, on a PC, which turned out to have been written in compiled BASIC. When I asked the people responsible why they had chosen BASIC they said that, at the time the programs were written, it was the only reliable compiler that was available. So far as I know, the programs have now been rewritten using one of the more modern compilers but it did emphasise that a language like BASIC, for all its limitations in the Microsoft form (no procedures or multi-line functions) could be used for programs which would sell, and sell repeatedly, at prices in excess of £1000 per copy.

I recently received, for review, a copy of a new language called "Charm". I shall have more to say about this in the next issue of this column. The author has put a lot of work into it and it certainly seems to have useful qualities but I did feel that, in the material he sent to me, he didn't

put enough emphasis on telling me why I ought to be interested in in another language. One thing I need to know is "what's in it for me?" as a programmer. Now that so many programs and applications are clamouring for attention, you need to show why a new one is worth considering.

Before starting work on developing something that will involve you in a great deal of work, you need to assess the size of the potential market. Often, unfortunately, that will be much smaller than you would like – and there may be nothing that you can do about it. The number of Archimedes machines in existence gives an upper bound on the number of copies that you can sell but you will also need to remember that some of the users won't buy anything else anyway, some will not have any interest in your part of the forest and quite a lot of them will already have some software that they will use in preference to yours.

I, for instance, am unlikely to buy Schema – not because there is anything wrong with it, but because I don't have much need for a spreadsheet and Pipedream will do all that is necessary. The problem isn't just money; with many of the programs I use regularly, I don't need to think about the technicalities while I am working and can save my energy for the work I am doing. A new piece of software needs a lot more thought at first and for some applications it's just not worth the effort.

To get your message to the maximum number of potential buyers you need to set out the benefits of your program, and this applies to all programs, showing why it would be worth having. Set them out in a way that would help a potential user explain to his boss why the purchase price would be worth spending. At the same time you must not oversell it in the way of the advertisements for Microsoft's latest spreadsheet which claimed more time savings in a week for the "average spreadsheet user" than the real average user spent using his or her spreadsheet.

At one time APL was sold in this way, with claims that you could write an APL program in

half an hour while a COBOL programmer would take four weeks to achieve the same result. I don't doubt that this was true for some carefully selected programs, but I wouldn't have tried to write them in COBOL anyway.

If you are trying to sell the idea of a new language it is probably best to start off, at least to yourself, by explaining in what way it is better than BASIC. This is not because of the superiority of that language, but because it is the one which is certainly available to every Archimedes owner. From then you can go on to explain how it improves on the other standard languages. In some cases, of course, this will be by restricting the features while making them easier to use. The dBase language is a lot less powerful than Pascal or 'C', but you need much less programming skill to achieve significant results in a limited field.

Pascal compilation

I'm sorry, but there was a mistake in my article last month. The program from David Pilling does not multi-task while compiling. However, it is still well worth buying as it makes the work of developing programs very much easier. You can do multi-tasking compilations by creating an obey file with all the necessary instructions in it and then executing it from within an !Edit task window.

A decision which affects Pascal programmers is when to use '\$include' and when to use 'import' to bring in pre-written sections of program. If the particular routine is only used once in the whole program, there is probably nothing to choose between them, except that the import method will lead to a slight reduction in compilation time.

The big argument for using 'import' in your own programs, is when you need to include similar

routines in various parts of your program. I have a number of string handling routines which have their own routines on which they call. If you use a simple '\$include' method you may end up with including the same routines several times in the same program. To avoid this, you may need to include all these 'pre-routines' at the start of the main program, which then means that one simple include statement won't do the job. This is one place where the 'import' method really scores as, no matter how many times a routine is imported by your program, only one copy of the 'aof' file will be appended when the final program is linked. **A**

CASA

Computer Aided Structural Analysis

CASA is the most advanced structural analysis package available for the Acorn Archimedes.

Indispensable for all Engineers & Engineering Students.

Fully RISC OS compliant : Very powerful and easy to use.

We believe that you cannot find a more powerful and flexible commercially available Structural Analysis package at this price on any machine.

Send now for a free evaluation disc of 2D Frame.

	ENTRY LEVEL	FULL VERSION
2D FRAME:	£ 150 +vat	£ 450 +vat
2D GRID :	£ 150 +vat	£ 300 +vat
BOTH :	£ 250 +vat	£ 600 +vat

Developed with Silicon Vision's RiscBASIC Compiler and the Dabs Press Archimedes Basic Compiler.

VISION SIX 13 Paddock Wood, Prudhoe, Northumberland. NE42 5BJ
Tel: (0661) 33017 Fax: (0661) 36163

Software for

ShowPage

ShowPage is a PostScript compatible interpreter running under RISC OS.

Over the last 6 years PostScript has established itself as an industry standard graphics programming language. Pioneered by Adobe for use in the original Apple laser printers, it is now used in all manner of output devices such as colour printers, and typesetting machines.

ShowPage will be attractive to those wanting to learn and explore this programming language and those wanting to print and use PostScript files from other machines.

ShowPage is fully multi-tasking and RISC OS compatible. It can read any PostScript file and output either to a window on screen, or to the currently selected RISC OS printer. It can therefore be used to make even the lowest cost dot-matrix printer PostScript compatible. When used in conjunction with LaserDirect, it can turn this printer into a very fast and fully fledged PostScript compatible laser printer.

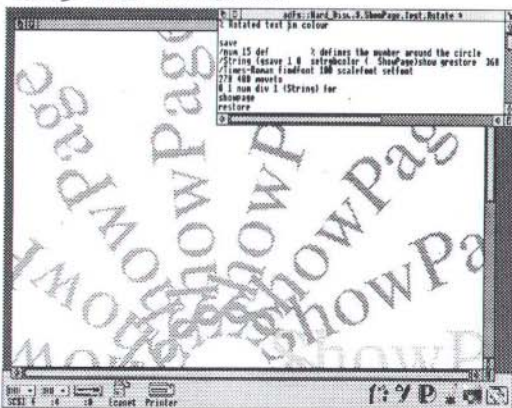
ShowPage supports the colour extensions and can create a sprite file of any required size. It can therefore be used to incorporate PostScript graphics into other RISC OS applications. It uses the RISC OS outline fonts, rather than the conventional PostScript fonts, for all

rendering, so it is compatible with the wide range of Archimedes outline fonts now available for this computer.

ShowPage has a simple built in editor allowing PostScript programs to be entered directly, and interactively with the results shown on screen in another window.

Showpage is compatible with the output from Acorn PostScript printer drivers. Minimum recommended memory is 2Mbytes.

£149+VAT (£171.35 incl.)



Package includes a spiral bound manual detailing the ShowPage version of the language. 320 page PostScript language reference manual by Adobe. 240 page PostScript language tutorial manual by Adobe. Discs containing ShowPage and example programs. AnswerG, BookM, Pembroke RISC OS outline fonts.

the Archimedes

An equation building tool that complements many RISC OS applications, in particular DTP and word processor programs such as Impression and Impression Junior.

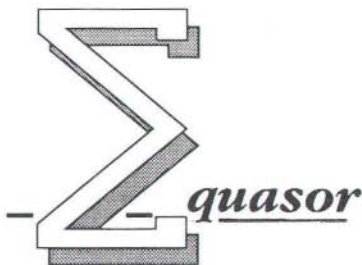
Many users of the Archimedes have a need to include complex mathematical formulae or equations into documents. Equasor allows equations to be built up on screen, graphically, from their component parts. Using the Acorn outline font system it presents a totally accurate view of the final equation at all times.

It simplifies the building of equations by presenting palettes of symbols, functions and operators which can be selected just by clicking with the mouse. It intelligently scales and re-sizes features such as summation symbols, brackets, and square roots as the equation is edited so they are always the right size.

Once the equation has been created it can be saved or exported to any number of compatible RISC OS applications. In DTP packages it can be dropped into frames just like any other drawing where it can then be scaled and positioned as required.

When used in conjunction with Impression II, it can take advantage of the latter's embedded frame capability to embed

equations into the text, even on the line. Once embedded in this way, the equation will then flow with the text as part of the text.

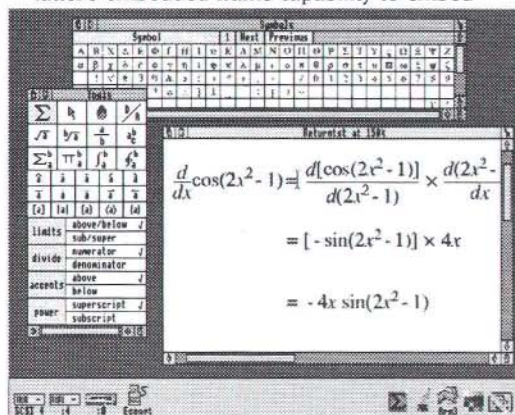


Features:

Multi-tasking RISC OS application. Supports direct in-memory transfer of equations for the fastest, simplest integration with other RISC OS applications. Any number of equations can be handled at the same time. Equations can be viewed and edited at any scale. Saves equations as Drawfiles compatible with all applications that support this format. Supports multiple different RISC OS outline fonts and so is not limited to the Math/Greek font supplied.

- Supports region selection and cut, copy, paste between equations and documents.
- Styles for global control over fonts, size, spacing etc. of variables and operators. Effects give additional control over the appearance of individual parts of an equation.
- Small, compact program perfectly suitable for 1 Mbyte machines.

Package includes a 60 page spiral bound manual with detailed tutorial reference, and index. Discs include the program, example equations, and Math/Greek outline font.



£49+VAT (£56.35 incl.)

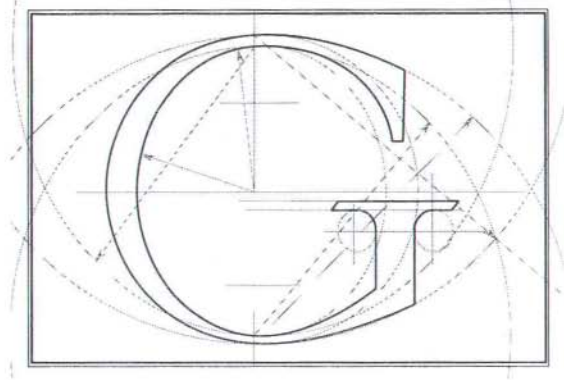


Computer Concepts Ltd

Gaddesden Place • Hemel Hempstead • Herts • HP2 6EX • Tel. 0442 63933 • Fax 0442 231632.

I M A G I N E

...what your Archimedes would be like if you could only print like this and we didn't produce over 200 high quality PostScript™ compatible fonts.



As well as the usual **English** (Latin 1) alphabet we have designed fonts for **Cyrillic, Greek, Hebrew, Latin 2, Latin 3, Latin 4 and Latin 5. Bengali, Bangla, Assamese, Devangari, Bihari, Hindi, Marathi, Sanskrit, Farsi, Persian, Gujarati, Gurumukhi and Tamil.**

It has been our ambition to become number one in the font market; we have, with your help, done this. This achievement would be enough for most companies, but not The Electronic Font Foundry. To enable our customers to get the most out of their investment we supply what we consider to be the very best in after sales support. We offer a free telephone hotline for technical enquiries to all our registered customers.

We are also supply DTP hardware and software. We do not sell *everything*, only the products we consider good value for money.

For a free 28pp Font Catalogue and Price List contact us at:

T·H·E·E·L·E·C·T·R·O·N·I·C·F·O·N·T·F·O·U·N·D·R·Y
18, Brockenhurst Road, Ascot, Berks. SL5 9DL
Telephone (24hrs) or Fax: 0344 872923

Multi-media Column

Ian Lynch

Last month, I finished by saying that I would go through the authoring of a simple Genesis 2 application, but first a couple of points about distribution. The application can be made available to other people by supplying it with a copy of the Genesis Browser – as long as it is not for gain. (The Browser allows other users to look through your application, but not to alter it.) In other words, Oak Solutions will allow the Browser to be distributed as long as you are not selling the application commercially. If you do want to sell commercial applications authored in Genesis, it will be necessary to pay Oak Solutions a small royalty for the Browser.

Authoring a Genesis 2 application

The application I am going to produce will provide some support for AT 14 (Sound and music) of the Science National Curriculum at level 5. If this doesn't mean anything to non-education readers, don't worry, it confuses most people in education too! The point is just that I need a focus and this gives me an excuse to put text, graphics and sound into the application.

Planning

To author any application, it is necessary to have a topic, and an idea of what you are aiming at. This can be planned out in great detail with story boards, flow charts etc or it can be done on the hoof, so to speak. Your preferred method will depend on several factors, not least the complexity of the task, but it is easy to modify your work, so a flexible approach is always possible. This rather reminds me of the conventional wisdom of producing flow charts before writing a program. Some do, but many don't and many do their planning in a different way. The only time I tried to use a flow chart for a piece of assembler I was writing on the BBC B, before writing it, I got in such a tangle I started again. My only useful flowcharts have been the ones I did to pass computational Mathematics examinations at University – well at least I got a certificate for them! I do intend to encourage planning but not with very

rigid rules or giving the idea that there is one universal "right answer" to planning methods.

Our application needs to address the following information supplied by the National Curriculum.

- *understand that the frequency of a vibrating source affects the pitch of the sound it produces.*
- *understand the relationship between the loudness of a sound and the amplitude of vibration of the source.*
- *understand the importance of noise control in the environment.*

"Pupils should explore sound in terms of wave motion and its frequency. They should have opportunities to develop their understanding of the properties and behaviour of sound by developing a wave model, for example, through observation... This should be related to pupils' experience of sounds and musical instruments, acoustic and electronic instruments and recording and synthesis."

The first thing we must decide is how comprehensive the application is to be, what resources are available and so on. One good point to note is that, if you own the Genesis 2 editor, you can take someone else's work and add refinements quite easily. In fact, a teaching application about sound could well employ other RISC-OS applications such as Armadeus but we will keep things simple since it can't be guaranteed that you all have any particular application.

What we will set out to do is to reinforce the main physical parameters of waves, (wavelength, amplitude and frequency) and also how wavelength and frequency are related to speed. Our application needs a title page and then some linked pages which interactively explain the words and concepts involved. We should try to make the presentation of the information attractive and outline fonts make a big difference here, as does a multi-sync monitor in a 256 colour mode! However, before I get too carried away, for this exercise I will only use the system font, Trinity and Homerton and try to make the application

suitable for a basic set up. I would like to know whether or not this approach should be general.

Finally, interaction is known to hold the attention better than simple presentation, so it helps if we force the user to answer questions and make decisions when using the application.

Getting started

Starting the Genesis Editor is done by double-clicking on it in the usual way. When it is installed on the icon bar, <menu> produces the option NEW, from which you give the application a name, in this case Sound and then drag the icon into a suitable viewer directory. A blank page appears which just looks like an empty RISC-OS window. The size and shape of the window can be altered in the usual RISC-OS way. In order to get information to display in the window, frames are used in a similar way to a desktop publisher. A frame is created by simply dragging the mouse holding down <select>. Once a frame exists, you can put a variety of things into it. First you can type text, which can be edited etc like in a DTP. Next, you can drop Draw files or sprites into the frame which can be scaled and dragged about. Then there are Euclid films and 3-D pictures, Maestro files and Armadeus sound samples. Finally, you can drop applications into frames and these can then be launched from Genesis and run as if part of it.

The title page

First drag out a box (simply drag the mouse with <select> held down) the width of the window and type in the text "An example of an approach to Science AT14". Then MENU - INFO - FONT - Trinity.Bold and Size 20. This gives us a title. Now to centre the title MENU - FORMAT - CENTRE. Note that you must click in the frame you want to apply something to before you request the style or format from the menu, otherwise, if you had several frames, Genesis would not know which you wanted to alter. Next, we make a larger box underneath in order to type

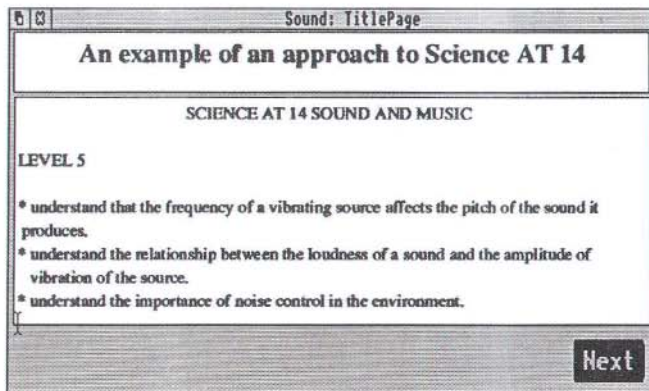
in the text. The text is entered at 13 point in Trinity.Medium font. In order to make the page look attractive I have used a grey background for the whole page and a white background for the frame.

The picture below shows what it should look like. Note there are no scroll bars on this window. This is to prevent adjustment since it is not required in this application. To alter the window settings, you need to go PAGE - INFO - WINDOW and call up a dialogue which allows you to specify which of the window adjustments is available.

Buttons

The last thing to do is to make a way of moving from this page to the next. Buttons are small objects which cause something to happen when the user double clicks on them. Several of the ones more commonly needed are provided in GenLib, a genesis resources library, but you can also design ones of your own quite easily. I have used a "Next" button on my page so that the next page I design will be displayed automatically when the user double clicks on this button.

Well, perhaps a little long winded, but we have our first page. Next time, I will build on from here some more pages describing how they can be linked. I will pass on the application and the Browser to Paul so that, if you get the Archive monthly program disc, you will be able to see how the application is built up during the next few issues. **A**



THE WORLD OF LINGENUITY

More technology for less money

**SCSI
NEWS**

**HARD DRIVE - IMPROVED PERFORMANCE
AND PRICE REDUCTIONS**

A3000

SCSI INTERFACE CARD

£149.00 PLUS VAT

**NEW
PRICE**

20MB HARD DRIVE

£399.00 PLUS VAT

**NEW
PRICE**

40MB HARD DRIVE

£589.00 PLUS VAT

ARCHIMEDES

SCSI INTERFACE CARD

£169.00 PLUS VAT

**NEW
PRICE**

20MB HARD DRIVE

£349.00 PLUS VAT

**NEW
PRICE**

40MB HARD DRIVE

£485.00 PLUS VAT

PERFORMANCE

Breakthrough

**THE BEST
PERFORMANCE
40 MB
HARD DRIVE
AVAILABLE
FOR THE
ARCHIMEDES
AND A3000**

SCSI DEVICES WITH A
CAPACITY OF UP TO 1000 MB
ARE AVAILABLE

SNAPSHOT

COLOUR IMAGES "GRABBED" IN REALTIME
Snapshot allows the Archimedes user to digitise pictures in colour and realtime, using standard Video equipment.



You can
input via a
Colour Video
Source (PAL),
including Camcorders,
Video Cassette Recorders,
and TV Tuners.

Snapshot is a full 12 bit digitiser with an enhanced real-time display. Sprites can be saved at a rate of up to 84 per minute, or raw image data can be processed with Enhance (supplied with package).

SNAPSHOT

£339.00 PLUS VAT

**NEW
PRODUCT**

*Colour Converter still
available for those with Watford Digitisers.
Ring for details*

Contact your local dealer
for further details about all
Lingenuity Products.
In case of difficulty ring (098 685) 477

HOTLINK PRESENTER

TALKS TO PIPEDREAM 3

For the first time, two Acorn architectures can communicate with each other in real-time in the RTSC OS environment.

HotLink Presenter includes all the features of Presenter II (the professional graphics programme which enables you to present your data graphics in bar, pie or line format) with the additional benefit that it can be updated automatically from Pipedream 3.

Updates are available for existing Presenter II and Presenter users, as well as site-licences for multi-station installations.



**NEW
PRODUCT**

HOTLINK PRESENTER
£49.95 PLUS VAT

PRESENTER STORY

You've heard about Presenter Story - well now its available!

Presenter Story is a revolutionary software package that enables you to create your own presentation on a work-station and project it into any of the following:

- Large screens
- PAL/Composite Video Monitors
- Analogue/RGB Monitors
- Video Walls
- Overhead projector displays

Use your Archimedes or A3000 for that important presentation. You can change your presentation at a stroke in a few seconds - no more last minute panics getting new slides or acetates made. Presenter story is ideal for sales presentations, corporate presentations, training programmes, internal departmental presentations, or home or studio video application.

PRESENTER STORY
£169.00 PLUS VAT

**NEW
AVAILABLE**

L I N G E N U I T Y
P R O F E S S I O N A L

Wood Farm Linstead Magna Halesworth Suffolk IP19 0DU Tel: 098 685 477 Fax: 098 685 460

ARCterm 7

£79.95 inc VAT

"ARCterm is a truly great comms package even compared with the best from other computers...the viewdata emulation is simply the best I've seen." **Acorn User April 1991**

ARCterm 7 provides a comprehensive selection of terminal emulations and file transfers in a single multitasking RISC OS compliant application - allowing other tasks to be carried out while, for example, a download is taking place. Standard RISC OS menus can be used to access the functions or alternatively the extensive keyboard shortcuts can be used.

Features provided include:

Emulations: TTY, VT52, VT102 (including printer support and 132 column mode), PC ANSI, TTNS/Campus 2000 (developed in conjunction with Hampshire LEA), BBC scrolling and Viewdata. Text emulations have a 256-line history buffer for reference or printing/saving.

File transfers: Xmodem/CRC/1k, Ymodem/-g, Zmodem, Jmodem, Kermit (including long packet, compression, and server support), SEALink, ASCII and CET.

Host mode: Allows remote access to your computer, including public and private message facilities, file transfer, and '*' command access.

Dial store: 100 names, numbers, configurations and log-on sequences can be stored (password protected if required). Facilities to search/sort the directory and also to import ARCterm 6.01 or Hearsay format directories are included.

Error correction: MNP level 2 and Vasscom error correction protocols are supported in software, along with modem driver support for error-correcting modems.

Script language: A structured script language is provided to allow automation of complex communication tasks. It includes such features as for-next, repeat-until, while, switch-case and if-then-else structures, local variables, functions and file handling. Example scripts are provided to automate tasks such as mail collection/delivery and a supplied converter will import ARCcomm scripts.

Modems: Supports most modems, including: HST, SM2400, WS3000/4000, TM512, Linnet, Quattro, Hayes, Demon.

For more information ring and ask for the full specification or call our BBS system:

The Serial Port, Burcott Manor, Wells, Somerset, BA5 1NH
Voice: 0243 531194, Fax: 0243 531196, BBS: 0749 679794/670030

THE
SERIAL
PORT



Using the PC emulator – Part 8

Richard Forster

If you have followed the series thus far, you should be able to write powerful and graceful batch files with ease, aided only with a humble copy of edlin. This month it should become even easier, as we take a look at a few of the more advanced features of edlin. Of course, the information is applicable to any file created by edlin, from batch files to simple text files.

The first command of interest is "c" which allows you to copy a block of text from a to b. To demonstrate the various abilities of this command first create a text file of ten lines. There are no restrictions on the contents but if you keep each line less than one screen line in length and with different text on each line, you should find what follows easier to understand.

The copy command is one of the more informative commands which edlin offers. If you forget to mention where you want to place the text it will actually tell you this, as opposed to giving a cryptic response, more typical of other commands. This is useful, not least because there are a lot of available options for the command. The basic command syntax is:

```
<range-start>, <range-end>, <line>  
                                , <number>c
```

The most important parts of the command are the commas. If you exclude one of the other details (as we shall do below), it is still vital to include the comma or the computer will be unable to work out which bit of data has been left out. The only exception to this is the comma after <line>. The most likely copy you will want to do, is to copy a block of lines a single time. To demonstrate, we shall copy lines 3-5 into the gap between lines 8 and 9. Type in:

```
3, 5, 9c
```

If you now do a listing of your file, you will see that there are now thirteen lines, with line 3-5 identical to lines 9-11. From this, you can see that the third item in the command shows the line just after which you want your text to be inserted.

You will notice that we have not used the final comma or number. We could use these if we wanted more than one copy of the line. So, to have four copies of line 1 placed after line 4 type:

```
1, 1, 5, 4c
```

A listing of the file will now reveal four copies of line 1, starting from line 4 as required. You should also notice that the asterisk which marks the current line has moved to line 4. Whenever we do any copy command, you will find that it moves to the beginning of the new version of the copied text. This asterisk is actually very useful, as it allows us a couple of short cuts with the copy command.

If you omit the starting number for the range, the copied lines will start from the current line and continue to the ending range. If you omit the second number, the block copied will end with the current line. You can also omit both numbers which will cause only the current line to be copied. To copy lines 2-4 with our present situation we could therefore type:

```
2, , 8c
```

and if we then wanted line 8 to be copied twice so it occupied lines 14 and 15

```
, , 14, 2c
```

If you want to copy something to the end of your text, you do not need to specify the exact number. If you had a 50 line long document and you required a line of text to be copied to line 51 (the next free line), then the third number can be set to anything above 50. The only difference between the copies is that the current line is set to the value given. Putting a 75 would therefore append the required text and then place the asterisk on line 75. When you list text, the listing is centred around the asterisk line and so you may find the text apparently has "vanished" after trying such a command.

It may happen that you wish to move a block of text. You could of course do this by using the copy command and then using the delete command on the original block of text but edlin

supplies an extra command with all of this rolled into one, “m”, which, not surprisingly, stands for move. The syntax of the command is very similar to that of copy, except that there is no provision for making more than one copy.

As with the copy command, move allows you to miss out the starting number, ending number or both, and will take the missing digits to be the current line. You can also specify the number of lines you want to move by putting a + followed by the requisite number of line instead of the ending number. Create a new text file of ten lines and then type in:

```
3, +2, 10m
```

If you list the text you will see that lines 3-5 have been moved to before line 10. This may be hard to see at first, because lines 3-5 have now been deleted and so everything from 6 onwards has been moved back 3 places. The lines we have just moved should now be occupying the space from 7-10, as you would expect. Move has the same restrictions as copy, namely that the commas must always be included in the command and also that the range being copied, and the place being copied too, must not overlap.

There are two other facilities available to us which you would expect to find in any editing program - namely a search command and a replace command. The first part of both commands is the range, and it is the same for the two of them. As with the copy and move range, it consists of two numbers separated by a comma, although there is no comma after the second number.

Omitting the first number will start the search from the line after the current line and omitting the second number of the range will continue the search to the end of the file. You can of course omit both but whatever you do, you must still include the comma in your command line.

Directly after the range, you also have the option of placing a question mark. If you place one in the search command, you will be prompted for confirmation after each occurrence of the string and pressing <N> will get edlin to continue with the search. A question mark with the replace

command will get the computer to ask you for confirmation at each change that occurs.

The syntax for the two commands is as follows

```
<range-start>, <range-end>[?]r  
    <string1><CTRL-Z><string2>  
<range-start>, <range-end>[?]s  
    <string1>
```

The name of the command (either r or s) occurs after the range and before the text. String1 is the text that the computer searches for and it begins directly after the command letter. If, for example, you type a space after the s, then that will be considered to be part of the command. If you are using search, this is where the command ends and edlin will name the line containing string the current line.

Replace obviously requires a second string parameter so that the program knows what to change the old string to. You can omit this second string by simply pressing <return> after the first string and any occurrences of the first string will be deleted. If you want a replacement string, you have to indicate the separation between the two strings to the program. Spaces and commas are allowed as part of the strings and so is the end of file marker, if used. You should therefore press <f6> or <ctrl->ctrl-Z> in between the two strings.

If I wanted to go through my 500 line program, selectively changing the occurrences of “the pc emulator” to “the emulator” between lines 300 and 500 I would type in:

```
300,?rthe pc emulator`Zthe  
                                emulator
```

Whenever the string “the pc emulator” turned up, edlin would print to the screen what the line would look like with it replaced with “the emulator” ask the awe inspiring question “OK?”. A response of anything except a “y” would have edlin continuing its search for another occurrence of the string without changing anything. When the task finally comes to an end I would find that the current line was the one containing the last replaced string. If, in the above example, I had wanted all the changes to happen automatically without prompting, I would have left out the ?, and if I had only wanted it from the current line

onwards, I would have left out the 300.

There is one last edlin command for us to look at: "t" for transfer – this allows us to merge another file with the file we are editing. The syntax of t is:

```
<line>t<filename>
```

Line is simply the number of the line before which you want to place the other text. Not surprisingly, if you omit a number in this place, edlin will take line to be the current line. After the t, you simply put your filename, including path if necessary, and it will be loaded in and placed

inside your program. So, if I was writing my letters on edlin and I had a file called "middle.txt" which contained a paragraph I always placed in the middle of my letters, to place it in the middle of the 150 line letter I had in memory, I would type:

```
150tmiddle.txt
```

Why I would be writing my letters on edlin is left as an exercise for the reader. Next time, we shall head back to the boot disc and dissect some of the programs on it so far unscathed. **A**

Matters Arising

• **ARM3 Software** – CJE Micros have admitted that a number of their ARM3 boards have been supplied with control software written by Aleph One. CJE Micros have apologised to Aleph One and agreed to make a payment in compensation. CJE Micros now have a new version of their ARM3 control software which includes a number of new facilities. Updates are available free for all CJE ARM3 users.

Aleph One have received payment from CJE Micros and have immediately (and very generously) donated 30% of the compensation money to international relief through Archive's charity appeal. Many thanks to Aleph One. Ed.

• **Removable Drive problems** – By now, we have had enough experience of the MR45 drives to spot a couple of weaknesses.

First of all, it looks as if, because the unit is so compact, there can be problems caused by overheating. (Actually, we were given this tip-off by someone using them with Macs – MR45's are usually placed underneath a Mac Plus or SE.) The cooling fan is underneath the case so, firstly, you must never put the drives on a soft surface where the feet might sink in and allow the openings around the fan to become obscured. Secondly, given that the drive is on a hard surface, don't pack other things too closely around it, especially at the rear left which is where the fan is, because this again could inhibit the air flow. (This does not apply to the original metal-cased MR45's because they have fans facing out of the back of

the box.) Putting things on top of the drive seems to be less critical unless it is something that itself generates heat. I discovered this the hard way – I had my WS3000 modem on top of it which itself runs quite hot, especially when you also put a pile of papers on top of it as I did. When I suffered a disc error and lost a couple of articles, I moved the drive to a position where I wouldn't be tempted to cover it with paperwork.

The second weakness is that it looks as if the auto-parking of the heads is not infallible. In other words, if you regularly switch the power off without pressing the release button or dismounting the drive, it is possible that you may get a head crash eventually. So, you have been warned – always remove the disc **before** switching off the power. The problem is, of course, that you cannot allow for power failures. What we are therefore saying is that the drives are not 100% reliable. In fact, Oak Computers have now decided not to supply these 45M removable drives because they don't feel that the drives fit in with their "zero defect" policy.

Never-the-less, I am using MR45's all day, every day and I am prepared to take the risk because they are just SO convenient for me. All the material for the magazine is held on one of these discs and I can take it backwards and forwards between home and the office. Before I had the MR45's, I had to use floppies to carry the text back and forth, copying it to and from the hard drives at each end which was a real pain. If I

wanted to do some work at home, I had to remember to copy the files to floppy and then remember to copy them back onto the hard drive in the office. As it is, I know that I will always have access to the most up-to-date information

and all I have to remember to do is bring the MR45 cartridge home with me. I am aware that there is always the possibility of data corruption, so I back up all the current files onto the fixed hard discs fairly regularly. **A**

Small Ads

• **18-pin heavy-duty Hermes printer**, 100 cps, hardly used £950 offers? PipeDream 3 £55, Terramex £5. Phone 0483-62586

• **30 colour pallettes** – send £4 or £3, S.A.E. and formatted disc to R C Melling, 80 Severn Road, Culcheth, Warrington, Cheshire, WA3 5EB.

• **A310's for sale** – several of different configurations. For details, phone 0272-342180.

• **A310M colour + backplane**, 40M hard drive £950. (Will split.) A440/1 with 8M ram £1700, Geniscan A5 scanner £95, Panasonic KXP1124 £140, Cumana 40/80 drive £70, Acorn DTP £40, Rhapsody £35, Knowledge Organiser £30, Interdictor 1 £10, ArcDFS £20. Phone Geoff on 0487-80632.

• **A3000 1 M ram board** upgradable to 4M £50. Phone 0332-701969.

• **A3000 colour** £700, Chromalock 235 £175, Atelier £70, Splice £15, Tween £15, Render Bender £45, five graphics discs £15. All ono, £950 the lot. Phone 081-670-8055.

• **Acorn Colour Monitor** reasonable condition offers – buyer collects (Sheffield). Phone 0742-750619 evenings or mbox on Archive (#419) or Arcade BBS (#274).

• **Acorn DTP £60**, Genesis £40, FWPlus 2 £40, BBC Elite £12. Wanted: Poster, Atelier, Pipe-dream 3, ROM board, 5¼" 800k disc drive, Scanlight Plus. Phone 0752-783663.

• **Acorn Prolog X**, as new, £70. Phone Donald Prest on 031-336-4491.

• **Miniscribe 20Mb 3½"** hard disc, Acorn podule and Computerware 4 slot, 2 layer backplane and fan, £150. Phone 0742-750619 evenings or mbox Archive BBS (#419) or Arcade BBS (#274).

• **Nightingale modem** £20, Commstar II (BBC) rom £5, Hearsay £28, Knowledge Organiser £26,

Artisan II £26, French Correspondence £12, Fads £15. Des Woon 0255-880257.

• **Ovation** £65, Apocalypse £10. Colin Thompson on 069-76530.

• **Risc BASIC Compiler** £50, also many games including Interdictor 1 £14 and E-Type £8. Phone 0843-603177.

• **Risc User magazines** first 31 copies plus binders £15. Voltmace joystick £12.50. Phone 021-705-1309.

• **System Delta Plus** (1.09) £30, SigmaSheet (2.01) £30. £50 both. All o.n.o. Phone Stuart Bell on 0273-304825.

• **Wanted – RISC-OS / ANSI C Programmer** with spare time to translate exciting educational program. Phone 0203-616-325.

Charity Sales

The following items are available for sale in aid of charity. PLEASE do not just send money – ring us on 0603-766592 to check if the items are still available. Thank you.

(If you have unwanted software or hardware for Archimedes computers, please send it in to the Archive office. If you have larger items where post would be expensive, just send us details of the item(s) and how the purchaser can get hold of them.)

User Guides £2 + £3 postage, Used discs 50p each, 10 for £4, 50 for £15, Acorn ROM/RAM podule £18, Family History £9, Global View £4, Personal Investor £9, I/O podule £50, StarTrader £5, Twin £10, Quazer £3, Integrex colour dump £10, Interdictor 1 £6, Holed Out £8, Superior Golf £9, Trivial Pursuit £9, Artisan Support Disc £2. **A**

Competition Corner

Colin Singleton

Two players in a game of Snap each have the thirteen cards of one suit, shuffled and stacked face down in front of them. They turn up their cards one at a time, simultaneously, and shout *Snap!* whenever the two cards presented at one turn have the same value. We are not concerned with who is quicker, but with the number of snaps there might be in the course of the game.

Considering one hand as a standard sequence, there are 13! (thirteen factorial = 6227020800) different possible sequences for the other.

How many of these will produce no snaps in the course of 13 turns? How many will produce *exactly* one snap (not more)? Two snaps? Three snaps?... Thirteen snaps?

If you find that too easy, then consider the game played with a full pack of 52 cards each. In this case cards must match *exactly* i.e. value and suit.

You will, of course, need multi-length arithmetic for this one.

Entries and comments either to Paul at N.C.S. or to me at 41 St Quentin Drive, Sheffield S17 4PN.

The solution to the November (Seven Dwarfs) Competition is that there are 42 groups of possible seating positions. 14 groups contain just one position each, 14 contain 57 each and 14 contain 302 each.

The prize is shared between Graham Jones of Durness and Dr W O Riha of Leeds. Graham found that the numbers are the *Eulerian Numbers*, for which there is a published algorithm. Dr Riha discovered a recurrence relation which enables you to calculate the numbers for N dwarfs from those you have already calculated for $N-1$ dwarfs. The calculation then becomes trivial.

The winner for December, Cyclic Numbers, will be given next month. Any more entries for January, Calculation of e , or February, Mastermind? **A**

4Mb RAM for the A305/A310. Now only £299 including VAT.

Expands the A310 and A305 to 4Mb RAM.
No soldering required.
Accepts larger OS ROMs if released.
Includes MEMC1a upgrade worth nearly £80.
ARM3 compatible.
A no quibble money-back guarantee.

For only £299. (£260 plus VAT).

Further information from;



IFEL, 36 Upland Drive, Derriford, Plymouth PL6 6BD. (0752) 847286

BASIC Plots Converted to Draw Files

Steve Kirkby & Dr G Toulmin

The clever part (the program) was devised by Dr George Toulmin while Steve Kirkby wrote this article.

What the program does

This program will convert the coordinates of a set of points produced by a BASIC procedure into a Draw file. When this file is loaded into !Draw or !Draw1½ (Shareware 34) or Poster or a DTP package, it will behave exactly as a normal Draw file consisting of a single object. The Draw object produced consists entirely of straight line segments, i.e. no Bezier curves, and since the x and y coordinates of all points must be individually specified, circles, squares etc. must be so specified in the program rather than by the use of PLOT, CIRCLE, RECTANGLE etc.

The technique would be useful to anyone in science, mathematics, arts or craft/design (e.g. textile design or a Greek Key border or the curve of a table top?) wanting to create Draw designs based on mathematical expressions or geometrical procedures. These could be lines or trigonometrical or exponential curves and spirals which are impracticable to draw accurately by hand, and polygons and circles etc. whose position, size, distortion or orientation must follow a mathematical expression. Also, a Draw image has a number advantages over a sprite: it is printed to the higher resolution of the printer rather than of the screen, it can be manipulated in a host of ways and often it uses less memory than a sprite.

How it works

The demonstration program, which is sprinkled with REMs, essentially does three things. Firstly, it assigns values to the x and y coordinates of a set of points and stores them in an array with PROC_CreatePoints. (To create your own set of points, alter this procedure accordingly, including the value assigned to the variable NoOfPoints% if necessary.) Secondly, it converts them into Draw format using PROC_CreateDrawFormat. Thirdly, it saves the pairs of coordinates to disc in the

form of a Draw file under your chosen name, as a single object – PROC_Save.

You may also be interested to refer to Risc User's article in Vol. 3.5 and 3.6 on displaying Draw files from within a BASIC program (i.e. the opposite to the program in this article).

```
10 REM>BAS_Draw
20 REM By Dr G H Toulmin.
30 REM PROCsetup initializes.
40 REM Coords should be >0 and in mm.
50 REM PROC_CreateDrawFile(array,n)
   adds the n+1 points (array(0,0),
   array(0,1)) to the file called
   outfile$.
60 REM PROCsave writes data to file
   outfile$ and sets filetype
   to DrawFile.
70
80 PROCsetup
90 PROC_CreatePoints
100 PROC_CreateDrawFormat(coord(),
   NoOfPoints%)
110 PROCsave
120 END
130
140 DEF PROCsetup
150 REM Inserts 10 words of preamble
   into block plot%, eventually
   to be copied to outfile$.
160 DIM plot% 1023:plotc%=plot%:REM
   Initial allowance for output
   file: plot% remains unchanged
   but plotc% is redefined as
   required, by PROCadd.
170 DIM preamble%(10)
180 preamble%(&77617244,&C9,0,
   &5F534142,&77617244,&20202020,
   &7FFFFFFF,&7FFFFFFF,&80000000
   ,&80000000 : REM 4th & 5th
   words are the name of the
   prog. producing the file
   (ie., BAS_Draw)
190 minx%=&7FFFFFFF:miny%=&7FFFFFFF
   :maxx%=&80000000:maxy%=&80000000
200 FOR ptr%=0 TO 36 STEP 4:
   plot%!(ptr%=&preamble%(ptr%/4)
   :NEXT ptr%
```



```

210 ptr%=40
220 INPUT "Type the name for the
      DrawFile to be created (with
      pathname if necessary)"
      "'Eg., :Floppy$.DrawFiles.
      Spirall ",outfile$
230 scale=180*256*.039375:REM One mm
      in internal Draw units (PRM
      p.1489). The unconventional
      conversion is implied by
      Draw Edit box.

240 ENDPROC
250
260 DEF PROC_CreatePoints
270 REM Arithmetic spiral.
280 NoOfPoints%=500
290 DIM coord(NoOfPoints%,1)
300 FOR N%=0 TO NoOfPoints%
310   th=.1*N%:r=12.7*th/(2*PI)
320   coord(N%,0)=105+r*COS(th)
      :coord(N%,1)=150+r*SIN(th)
330 NEXT N%
340 ENDPROC
350
360 DEF PROC_CreateDrawFormat
      (array(),npts%)
370 REM Inserts points from array as
      one Draw "path".
380 LOCAL n%
390 bytes%=12*npts%+56
400 PROCpreamble
410 PROCadd(-1):REM No fill.
420 PROCadd(0):REM Line colour=black
430 PROCadd(0):REM Line width is
      minimum.
440 PROCadd(&20100042):REM Bevelled
      joins, butt caps, even/odd
      winding, triangle cap width
      =line width, cap length double
      line width. (PRM ppl794-1795)
450 FOR n%=0 TO npts%
460   IF n%>0 THEN PROCadd(8) ELSE
      PROCadd(2)
470   PROCstep(array(n%,0),
      array(n%,1))
480 NEXT n%
490 PROCpostamble
500 ENDPROC
510
520 DEF PROCpreamble
530 REM Writes heading for path.

540 pminx%=&7FFFFFFF:REM Min. values
      for box coords. initially set to
550 pminy%=&7FFFFFFF:REM largest
      possible pos. integer, and
      max. values
560 pmaxx%=&80000000:REM to largest
      neg. integer, to ENSURE they
      are reset
570 pmaxy%=&80000000:REM at lines
      680 and 720 when first path
      point written.
580 PROCadd(2):PROCadd(bytes%)
590 keep1%=plotc%+ptr%:PROCadd(0)
600 keep2%=plotc%+ptr%:PROCadd(0)
610 keep3%=plotc%+ptr%:PROCadd(0)
620 keep4%=plotc%+ptr%:PROCadd(0)
630 ENDPROC
640
650 DEF PROCstep(xx,yy)
660 REM Writes one pair of co-ords.
      and updates bounds.
670 v%=scale*xx:PROCadd(v%)
680 IF pminx%>v% THEN pminx%=v%
690 IF pmaxx%<v% THEN pmaxx%=v%
700 v%=scale*yy:PROCadd(v%)
710 IF pminy%>v% THEN pminy%=v%
720 IF pmaxy%<v% THEN pmaxy%=v%
730 ENDPROC
740
750 DEF PROCpostamble
760 REM Closes path and writes
      bounds in preamble.
770 !keep1%=pminx%:!keep2%=pminy%
      :!keep3%=pmaxx%:!keep4%=pmaxy%
780 IF minx%>pminx% THEN minx%=
      pminx%
790 IF maxx%<pmaxx% THEN maxx%=
      pmaxx%
800 IF miny%>pminy% THEN miny%=
      pminy%
810 IF maxy%<pmaxy% THEN maxy%=
      pmaxy%
820 PROCadd(0)
830 ENDPROC
840
850 DEF PROCadd(v%)
860 REM Adds the value v% to the
      output buffer.
870 plotc%!ptr%=v%
880 ptr%+=4
890 IF ptr%>1016 THEN

```

Basic Plots Converted to Draw Files

```
900 DIM new% 1023
910 plotc%!1020=new%
920 plotc%=new%
930 ptr%=0
940 ENDIF
950 ENDPROC
960
970 DEF PROCsave
980 REM Insert overall min and max
          values first.
990 plot%!24=minx%:plot%!28=miny%
          :plot%!32=maxx%:plot%!36=maxy%
1000 handle%=OPENOUT outfile$
1010 WHILE plotc%>plot%

1020 SYS "OS_GBPB",2,handle%,plot%
          ,1020
1030 REM Unlike *Save, can
          continue (update) open file.
          PRM p.872.
1040 new%=plot%!1020:plot%=new%
1050 ENDWHILE
1060 SYS "OS_GBPB",2,handle%,plot%,
          ptr%
1070 *CLOSE
1080 OSCLI "SetType "+outfile$+
          " DrawFile"
1090 ENDPROC A
```

Shareware Disks N^os 25 & 30

John Brooks

Shareware N^o 25 is a compilation of mathematics programs/functions and procedures. Most are written in BASIC though there are some which use assembler. There are far too many items to mention individually as it would take up far too much space. However, here is a list of the type of programs included:

- Numerical integration: Simpson's rule
- Solution of polynomial equations
- Solution of simultaneous linear equations
- Generation of equations from roots
- Cubic splines and interpolation
- Primes
- Series
- Puzzles
- Fourier transformations
- Function plotter
- Extended precision calculator
- Recurring decimals
- 3-d surface plotter
- Frequency and time response of linear circuits
- Pole zero plots

Also included are various functions and procedures in these areas:

- Beta function
- Binomial coefficients
- Permutations
- Elliptic integrals
- Error functions
- Factorials

- Gamma functions
- Polynomial interpolation
- Integration
- Write# in ASCII form
- Hyperbolic functions and inverses
- Complex arithmetic and functions
- Polar to rectangular conversion
- Various matrix operations

Now some of this may seem very esoteric (I'm not a complete dummy at maths but some of this stuff I have never heard of) and the question is, "Is this disc worth £3"?

Well, that depends on what you want. To my mind, this disk is essentially a library of code for performing various mathematical tasks. If you ever need any of these procedures then you have these tried-and-tested versions to get you going. It saves a lot of work that way.

I also find that this type of disk is useful for looking at other people's code to see how they tackle things, I might pick up a tip or two to improve my own code (or indeed see some things to avoid), and there are plenty of examples to look up in here.

Shareware N^o30 is a "sound/music" collection consisting essentially of one application (!STracker) and a directory (Modules) containing some sample data for the application.

For anyone who has not yet heard of !STracker, more commonly called soundtracker, it is a utility

that plays "music" in the background whilst other work can carry on in the foreground. Four pieces are included in the modules directory:-

AxelF - theme music from Beverley Hill's cop

Dream - short, but nice

ProgFunk - err??

VivBeat - with some very convincing thunder

If you have access to any bulletin boards or public domain software, there are loads of sound-tracker modules around that you can acquire.

For those who have ever only heard !Maestro tunes, the quality and range of voices in sound-tracker modules is quite remarkable, especially if you have an external amplifier and speakers. Also

included on the disk is a utility called !RunThis which plays yet another soundtracker module called TESTMOD (I'm not sure that this would be called music though) and displays which voice is being used and which particular pattern is being played at the time. Finally, there is an !Edit file with some of the history and background information about soundtracker.

As one who likes messing around with computer music, I quite like this piece of software. It is not actually very useful by itself but is an impressive demonstration of the Archimedes' abilities. It could also be useful if you are writing some software which requires background music. **A**

Econet Column

Neil Berry

I have received a number of letters this month from network managers who are worried about the possible consequences of this series of articles, with regard to the security of their own networks. It would be nice to think that all network users were responsible people and that there was no such thing as hacking but, of course, this is a naive view. There are people who are not content with using the network as a normal user, but seem to want to just have a general fiddle. Whether the intention is destructive or not, this can cause real problems for network managers and so, in an attempt to keep the sanity of managers who read this column, I will restrict my comments and reviews to those of a rather non technical nature. I know this will disappoint those of you who have written to me asking for technical details but, to keep the peace, I will not be able to print system-privileged information.

Over the next few months, I will be writing about various types of connectivity from Econet brands and hard disc sharing systems, to external connectivity with IBM / DEC machines over Ethernet and Unix. To begin with, I will be starting with shared hard disc systems, in particular Nexus and the Software Solutions server.

A new concept from S.J. Research

The Nexus system consists of a hard disc shared

between a number of Archimedes machines and allows the formation of a common resource area where applications may be stored and as a temporary store for private files and data. The Nexus system uses a starred network topology, unlike Econet which uses a BUS system and, for this reason, is not dependent upon all of the machines functioning correctly. It comes in a large box, about the size of a 400 series Archimedes, containing a hard disc, and is intelligent enough to communicate with up to 8 RISC-OS machines simultaneously. The system uses twisted pair cabling and each system arm may be up to 100m in length, even without using line drivers, although these are available.

One of the main problems with older Econet systems is their slow data transfer rates, around 200 to 300 kilobits per second. S.J. with their new system have made a point of trying to maintain Nexus speeds close to that of a local Acorn hard disc, approximately 10 to 20 megabits per second. S.J. say that the system's response time, even with full capacity use from eight machines, should not drop below that of a floppy disc, which is obviously a great speed increase over Econet systems. Each Archimedes needs to be fitted with its own communication card, which would require a backplane to be fitted on an A310 but, other than this, no networking hardware is required.

The Disc Sharer

The Disc Sharer from Software Solutions, is a multitasking utility that allows Archimedes computers (and BBC micros) to access the local hard disc of another Archimedes machine, by using the Econet. Unfortunately, running the system down the Econet cables causes the same sorts of problems encountered with using the ordinary Econet system. Relative to the Nexus system, it is a lot slower and requires the presence of a hard disc and Econet hardware, to be installed on at least two machines.

Using the systems

Both of the systems are multi-tasking utilities which install themselves on the icon bar. The Nexus system installs itself as a dual icon on the icon bar, one for a personal 'scratch-pad' area and the other for read-only access to the shared application areas. The Nexus system is primarily aimed at the sharing of common resources, with only a small area for general read/write applications.

The Software Solutions' server, on the other hand, is more akin to an actual fileserver and, as it may be used on a mixed network of Archimedes and BBC's, speeds have to be such that the BBC's are able to cope with sending and receiving files to the main server computer. The size of work area of the Solutions server depends on the size of the hard disc available on the machine that is being used. However, the Nexus server is currently supplied as a standard 40Mb drive although S.J. are willing to discuss units with higher capacity for anyone who thinks that they really need more Mega-Bytes!

This limited capacity of 40Mb may seem to be a black mark against the S.J. server but, when you think about exactly how much space your frequently used applications actually take up, you might be quite surprised at how little space they do take. Suppose that a system was used by the full eight users and the server had a shared resource area of 20Mb, which is a lot of space for a read-only sector, you would have about 2Mb of 'user area' for each of the users.

The Solutions' server, on the other hand, is only restricted in space by the size of the hard drive

and will allow up to 32 users to be logged on. When a user is logged on, he would usually be presented with a normal view of the Archimedes hard disc. However, there are so-called 'fixed users' who are not allowed to see the root directory or other directories of the hard disc or to set the password or boot options etc. In this way, some basic forms of access can be implemented. In comparison to standard S.J. and Acorn file servers there is little or no user protection, by way of specific user areas and different levels of access, although the S.J. server does, in my mind, win through by having separately accessible storage areas rather than one single user i.d., as the Software Solutions' server has.

Setting up the systems

To use the Nexus system, you will require the S.J. hard disc unit of 40Mb which, for four stations, costs £1240. Each machine that uses the disc will require an interface card which comes as a standard podule for A300 and A400 machines and as an internal podule for A3000 machines. Either of these is easily installed by the user. Standard or custom length cables may be purchased to connect the machines in a star arrangement. Each of the standard cables has a D-Type connector at the disc end and a din plug at the podule end and can be between 1.5m and 30m, costing from £10.75 to £25.00, and ranging in speed from 20MHz to 10MHz for the longer cables. Therefore, to run a system of eight Archimedes inside one room will cost in the region of £2300 +VAT.

The Solutions' server, on the other hand, uses only the Econet system to communicate with its hard disc and so, for those establishments that already have Econet, no further hardware needs to be purchased. This must clearly be seen as an advantage over the Nexus system. The educational price for a network licence for the Disc sharing system is £126.50 inc VAT – much cheaper than Nexus. Of course, if you do not already have an Econet system, minimally consisting of at least a clock and connecting wires, then this of course would have to be added to the costing.

To sum up, I would personally opt for the Nexus system, despite its relatively high cost, mainly for

its ease and speed of use. However, the much, much cheaper Software Solutions Disc Sharer cannot be overlooked mainly because of its price.

What next?

In the near future, I hope to be dedicating a series of articles to the new Level IV fileserver from Acorn – when I've amassed enough information.

As always I can be contacted at: 21 Pargeter Street, Stourbridge, West Midlands, DY8 1AU (no phone calls please). If you have any comments about this column or would like to offer up some ideas, please feel free to write to me. If you have developed any new network software, no matter how trivial it may seem, I would like to see it and give it a review. **A**

Writing Maths: Equasor

Brian Cowan

How do you decide which computer to buy? This may seem a strange question with which to start a review of a software product but, hopefully, the reason will become clear as you read on. The sensible person would probably choose the computer which runs the software packages which he/she requires. By this definition, the early Archimedes owners would seem to have been somewhat lacking in sense! They purchased a machine with virtually no software base, a turbo-charged BBC micro with a desktop environment which was, thankfully, optional.

Foresight

What these "senseless" people appreciated was the phenomenal power of this new computer and its ARM chip set. Buying an Archimedes in those early days was an investment, or a gamble, depending on how you viewed it. With that sort of raw power available for the first time in a microcomputer, and at a reasonable price, the software should follow. When it did, there was the potential for some really earth-shattering products – and so it has transpired.

Good impression

Computer Concepts seem to have adopted precisely this philosophy. Readers will know of Impression, if not by experience, then by repute. This is the DTP package by which others are judged. I have been using Impression for the last few months and now I think I would be lost without it. At work, I have arranged for the purchase of a site licence so that my colleagues can also have the benefit, such is my regard for this product.

More goodies

In other areas also, Archimedes owners are finding new software which is the equal of, or better than, that available for the more "traditional" machines. For example Schema for spreadsheets, Pipedream for "virtually everything", Reduce for computer algebra, WorraCad for drafting, and new products on the horizon. Soon, we should have the last word in database programs, and new PC emulation which will eclipse even an IBM. There are certainly exciting times ahead.

Writing maths

But back to the subject of this review. I have mentioned in the past my particular need for producing mathematical equations within documents, as most of my writing is of a scientific or mathematical nature. In the past, I have been using First Word Plus together with a special maths font which I designed years ago, and which is sold by Ian Copestake Software as a "First Font". This has served me well and I have been reluctant to change until something much better came along. Perhaps it finally has.

First Fonts

I must, however, first extol the virtues of the First Font option. The advantage of this is that it is an *integrated* system. Text and the equations are all written together and the production of documents is a beautifully simple process. However, simplicity comes at the expense of flexibility. One has only the standard First Font font, and slightly different font sets are used with different printer drivers. For increased versatility in the production of scientific (and other) documents one must graduate to a more sophisticated system.

Next steps

There are two types of solution to this problem. There is a remarkable software package called $\text{T}_\text{E}\text{X}$. The Pascal program for this is in the public domain and there are implementations of this available for the Archimedes, both a PD version and also a commercial product. $\text{T}_\text{E}\text{X}$ is essentially a type-setting language. To produce a document, one writes a file of text and strange codes. This file is then processed by the $\text{T}_\text{E}\text{X}$ program, to drive a printer or possibly a screen previewer. So to write a document one actually types in what seems to be a load of gobbledegook. I think you have to have a certain kind of brain to do this sort of thing well. I have used $\text{T}_\text{E}\text{X}$ both on main-frame computers and on the Archimedes and I find it rather tough going. This is no criticism of $\text{T}_\text{E}\text{X}$; it is my problem. The Archimedes PD version I used is quite superb, with a really good screen previewer. Notwithstanding the excellence of the product, I prefer the other approach. I find it much easier to use a "what you see is what you get" system. So, I prefer to produce documents using a DTP type of program; I really need to see what is going on. The disadvantage (with existing systems) is that the production of text and the creation of equations are no longer entirely integrated.

Equasor

Equasor is an *equation generator*. It is not a scientific DTP program; it would usually be used in conjunction with a separate DTP package. Equasor is produced by Computer Concepts and so, in style, many aspects are similar to Impression. The two products, not surprisingly go together very well but Equasor can be used in conjunction with any DTP product, or it can be used alone, simply to produce equations. Part of the versatility of Equasor is due to the fact that it produces its equations in Draw format. Thus, an equation may be imported into any document which supports Draw objects or it may be sent to a printer driver. Using Impression's embedded frame facility, an equation may be incorporated into a line of text. In fact, embedded frames almost completely integrate the equation and text creation processes; this is a powerful feature of Impression.

Intelligent behaviour

In conception, Equasor is rather like the utilities FontDraw and FontFX in that it facilitates the creation of "fancy effects" from the available font sets but here, the fancy creations are mathematical equations. As a matter of course, all the usual mathematical features are provided, such as superscripts and subscripts, a variety of brackets, integrals, sums and products, roots and fractions, etc. However, the remarkable feature of Equasor is that it appears to be *intelligent*. Thus subscripts, superscripts and limits are automatically scaled to 75% of the preceding text. This applies recursively although any of these things can be overridden if required. The other aspect of intelligence in the program is that the cursor always seems to go to the right place at the right time while creating a complex expression. Thus, for instance, in producing a character which has subscripts and superscripts, having selected the character, the cursor moves to the subscript position. When these have been entered, on pressing the "arrow right" key, the cursor moves to the superscript position and when these have been entered, a further "arrow right" press moves the cursor to the normal position for the next full character.

EFF MathGreek font

It is an unfortunate fact of life (or so the mathematicians would have us believe) that our alphabet contains only twenty six letters. Mathematics thus makes frequent use of Greek characters. It also uses a variety of special symbols as well as the odd Hebrew character. Equasor is supplied with the MathGreek font set from the Electronic Font Foundry. In use, these symbol fonts are available from a symbol window rather like the !Chars application; "clicking" on a character in the window enters it into the equation at the cursor position. In general, the EFF font set is a good compilation of symbols and characters needed by the mathematician. There are a few extras that I would like to see, such as the second Planck's constant \hbar and the mathematical symbols \geq (of the order of or greater than), \leq (of the order of or less than) and \square , (as well as I can produce them using existing characters together with Impression's *Kerning* facility). I have one serious

criticism concerning the existing MathGreek font set, however. At present, EFF provide an upright and an italic set. However there is a serious need for bold versions of these, particularly for the Greek characters. Vectors are conventionally denoted by bold characters and one does use Greek vectors. I hope EFF will rectify this omission.

Proof of the pudding

The best way to understand Equasor is to use it. In fact, I extensively used beta test versions of the product for some time before I even had a manual. The fact that I was able to produce some quite complex equations is an indication of how intuitive the program is to use. Here are some examples:

$$Y = 1 + \frac{A}{1 + \frac{B}{1 + \frac{C}{1 + \frac{D}{1 + \frac{E}{1 + F}}}}}$$

This sort of expression is called a continued fraction. It does not look too complicated, but the important point to note is the ease with which this was produced using Equasor. The lines all adjusted themselves to just the required length and everything aligned automatically. It would have been quite a nightmare (for me) to produce such an expression using $\text{T}_{\text{E}}\text{X}$, calculating where to put the lines and characters. Now for an equation involving solid angles.

$$\frac{dP_n}{d\Omega} = \frac{1}{2\pi} (c)^2 \frac{d^2 I}{d\omega d\Omega} \bigg|_{\omega=n\omega_0}$$

This equation was quite straightforward to produce. I had a little difficulty in creating the vertical line of the right size; that was not done automatically. The next three equations were trivial to produce using Equasor. They really demonstrate the power of the program. Here is an expression concerning the refraction of the electric part of an electromagnetic wave.

$$\frac{E'_0}{E_0} = \frac{2nn'\cos(i)}{\frac{\mu}{\mu'} n^2 \cos(i) + n\sqrt{n'^2 - n^2 \sin^2(i)}}$$

Next we have the azimuthal component of an electric field expressed in terms of spherical harmonics. This involves subscripts and superscripts:

$$E_\phi = -\frac{4\pi}{2l+1} q_{lm} \frac{1}{r^{l+2}} \frac{im}{\sin \theta} Y_{lm}(\theta, \phi)$$

Now, in a different area of physics, comes a formula from what is called Fermi Liquid theory (one of my current projects). This involves all manner of subscripts, superscripts, primes, arrows and goodness knows what.

$$C = -T \sum_{\vec{p}\sigma} \frac{\partial n_p^0}{\partial T} \left(\sum_{\vec{p}'\sigma'} f_{\vec{p}\sigma\vec{p}'\sigma'} \frac{\partial n_{p'}^0}{\partial T} - \frac{\partial \Delta_\mu}{\partial T} \right)$$

Looking at these equations, you see that the Latin symbols are all printed in italic form. This is the conventional way and it occurs automatically (although this can be overridden). Greek symbols can be configured to appear italic if desired; convention is a little hazy here. Operators such as cos and sin are printed upright and these may be selected from a menu. Also, the menu allows one to create new forms, which can be stored for future usage.

Limitations and bugs

There is a class of mathematical objects which the present version of Equasor can not produce. These are things like matrices, that is, tables of symbols separated horizontally or vertically with no operator between them. Thus, as well as matrices, one can not create binomial coefficients, nor the Christoffel symbols of general relativity. In this last case, however, we can have a jolly good try. Here is the definition of a Christoffel symbol:

$$\left\{ \begin{matrix} ik \\ h \end{matrix} \right\} = \frac{1}{2} \sum_l g^{hl} \left[\frac{\partial g_{il}}{\partial x^k} + \frac{\partial g_{kl}}{\partial x^i} - \frac{\partial g_{ik}}{\partial x^l} \right]$$

The symbol is correct except that there should not be the horizontal bar under the i and j . I was surprised to discover a very strange bug in my version of Equasor: if you place two summation signs or two integral symbols adjacent to each other, then one of them blows up! I am sure this will be fixed on the release version. Finally, let's finish with a simple one: another equation from electromagnetism.

$$E_{\parallel} = \sqrt{\frac{\mu_0 \omega}{8\pi\sigma}} (1 - i)(n \times H_{\parallel})$$

As you can see, this is perfect.

Unfair?

You might think that I have been unfair in my review of this product as I have tended to concentrate on its limitations. Of course, the points about the MathGreek font relate to EFF and not to Equasor itself. Many of the examples I have given here demonstrate some of the very minor limitations in the program. This should be taken as an indication that I have performed an intensive test of Equasor and that most things I tried were a complete success. Also, as you will realise, Computer Concepts take the feedback from their customers very seriously: witness the evolution of Impression. So I am convinced that future versions of Equasor will address the few points I have made, to produce an even better product.

Some technical details

I mentioned above that Equasor produces its output in Draw format. This point must be clarified a little. Having produced an equation using Equasor, the next step is to save it. One has the choice of saving the object either in "Equasor" format or in Draw format. Both types of file may be dropped into Impression frames. In fact, the Equasor format file contains the same Draw code and it is this which produces the image in the frame but the Equasor format file contains more. It incorporates the specification of the equation. Thus this file may be loaded back into Equasor to be edited; this can not be done with the Draw file. The Equasor file can not, however, be loaded into the current version of Draw. The extraneous information confuses the

program. For this reason both file formats are required.

In conformity with Computer Concepts policy, the Equasor program is all written in ARM code. This leads to increased speed and efficiency and so must be rated as a plus point; it also discourages hackers!

In use

For those tricky parts of equations, you can zoom in to a magnification of up to 999% and you can pan out to 1%. Fine control over parts of equations is facilitated by *effects*, as in Impression. Also, there is full implementation of leading, spacing and kerning. So, equations can be laid out precisely as required. For those difficult times, there is an eighty page manual containing most information that should be required. In fact, as I said above, I have made very little use of the manual – the program is remarkably intuitive. However, whenever I needed to find something out, I generally managed to do so.

Included on the Equasor disc is a directory of sample equations. These are quite impressive and they really show off the program's extensive range of features. Funnily enough, I found errors in some of these equations but I think these should have been corrected in the release version.

Conclusion

It is always a joy to review a really good product. This is one such occasion. I have been wanting a program which would do this sort of thing, as I have mentioned in Archive from time to time, and here it is. The only serious limitation of Equasor is that you can't produce matrices (or at least I can't!). Apart from that, I am happy to say that I unhesitatingly recommend Equasor to all those who need to produce equations and/or incorporate them into DTP documents. It is certainly as good as anything I have seen on any other computer.

Equasor comes from Computer Concepts and the complete package costs £49 plus VAT. This includes the EFF MathGreek font. The Archive price is £52. **A**

Base 5

Base5 DBMS

Base5 DBMS is a suite of BASIC V functions and procedures designed to implement database programs. It is fully compatible with RiscBASIC and ABC compilers.

- ◆ Fully compatible with RISC OS
- ◆ User configurable
- ◆ Compatible with both Basic compilers
- ◆ Extensive search features
- ◆ Multiple databases in use simultaneously with easy communication between them
- ◆ Rigorous in-built error checking
- ◆ Comprehensive documentation of tutorial material, language reference and file format
- ◆ Numerous example databases and programs supplied
- ◆ Extensive import and export features
- ◆ A separate library of mathematical, statistical and calendar functions
- ◆ A fully multi-tasking database application !WimpBase5 as a get-you-started entry point

Base5 DBMS is available now for **£69** (no VAT). Site licences available.
Demonstration disc for **£5**, refundable on purchase of full system.

PairData

First of an increasing number of fully compatible products for use with Base5 DBMS.

- ◆ A BASIC V library for the creation and processing of coordinate pair data
- ◆ !MouseIn, a fully multi-tasking application to write scaled pointer coordinates directly into user designated fields
- ◆ Replace, count, delete or recall records meeting distance criteria
- ◆ Centre of Gravity, mean distances, nearest point calculations etc.
- ◆ Requires Base5 DBMS

Base5 PairData costs **£22.50** (no VAT) (£18 for Registered Users)

Direct from:

Base5
P.O. Box 378
WOKING
Surrey GU21 4DF

Introductory Offer

Base5 DBMS plus PairData for

£89 (no VAT)

Ten Tips for those with Bigger Memories

Stuart Bell

The old cliché about most human beings being creatures of habit is probably as true in the world of personal computing as in most other spheres of human activity. In other words, once we've developed a way of working, we tend to stick to that way, whatever happens.

In this case, the 'whatever happens' is the upgrade from 1Mb memory to 4Mb and an awareness, after a few weeks with the upgrade, that I wasn't really taking full advantage of it. An Archimedes with 4Mb is really quite a different machine from its smaller brother and it opens up new practices that simply aren't possible before the memory growth. So here are ten tips for those who have also been bitten by the upgrade bug. (Apologies to those lucky people who started with 4Mb, to whom all this is probably so boringly obvious!)

Multi-task your applications

This is surely the main reason for upgrading in the first place. BU (before upgrading), the power of RISC-OS simply can't be realised because you can't multi-task significant applications. However, AU (after upgrading) you can run, for example, both !Draw and Impression and this makes things much easier. Another good idea is to have !FontFX, a scientific calculator (PD versions widely available) and the RISC-OS printer driver all loaded on the icon bar. !Patience can be there ready for a quiet moment!

Auto-load your applications

Manually loading all the applications that you regularly use can be a little tiresome. Assuming that you have a hard disc, they can all be loaded onto the icon bar every time you reset or boot up the machine. (The only thing that stops floppy users doing this is disc capacity). You need a file called '!boot' in the root directory and can use *Configure Boot if you want to cause that file to be obeyed when the power is switched on, at a reset or <ctrl-break>. (Use *Configure Noboot to run a boot file on <shift-power on>, <shift-reset> or <shift-break>.) You also need to do a *OPT 4 3 to tell the system to "exec" the boot file.)

You can put all the commands to be obeyed in the !boot file, but it's simpler to put all commands to be obeyed once the desktop has been entered in a separate file. The !boot file contains the line:

```
Desktop -File scsi::winny.$
                        .StartList
```

when Startlist is the name of the file with the commands to be obeyed. My Startlist looks like this:

```
Filer_Opendir scsi::winny.$
                        .Documents
Filer_Opendir scsi::winny.$
scsi::winny.$.!Fonts
scsi::winny.$.!System
scsi::winny.$.!Edit
scsi::winny.$.!Draw!
scsi::winny.$.!Impress
scsi::winny.$.!1stWord+
scsi::winny.$.!FontFX
scsi::winny.$.!PrinterLJ
scsi::winny.$.!IconClock
```

The Filer_Opendir commands open directories on the desktop, ready for me to select the file to be accessed. Strangely, it seems that those opened second are displayed behind those opened first so, in my case, \$.Documents appears in front of the root directory.

!Fonts and !System are opened so that they have been seen before the applications that require them. Adding the command DeskTop to the end of the !Fonts.!Run file removes the need to press the space bar after the Font Catalogue has been displayed. Finally, the seven applications that I regularly use are loaded and will be shown on the icon-bar at the end of the boot process.

Re-configure your machine

You can save and restore the configuration details held in CMOS RAM during the upgrade process but it's not very useful. Most of the memory allocation values are set automatically, but others need revision. In particular, if you are using outline fonts, do re-set FontSize. Whilst you could keep a low FontSize and a higher FontMax,

I've found that Impression sometimes reduces the FontSize, with the consequence that fonts that used to be in memory then have to be reloaded from disc. Keeping FontSize high (I use 512K) prevents this from happening.

Consider new screen modes

With 1Mb, memory-hungry modes weren't really viable with some applications. I used mode 16 (132 columns) for DTP but then had to change down when I wanted to load a printer driver. Now, any mode can be used. In particular, for those with ordinary (not multi-sync) monitors, modes like 66, which Computer Concepts supply with the !NewModes module, giving 104 x 36 text resolution, are worth using. Multi-sync owners can have a field-day! To make the machine auto-boot into your required mode, the first line of my !Boot file is !NewModes. I then set the mode to 66 using the !Configure utility off the Applications disc.

Don't kill modules

A common problem discussed in Archive has been the fact that many applications load modules into memory when loaded, but don't remove them when the application is quit. This soon clutters up memory on smaller machines, and the solution identified was to add RmKill commands at the end of application !Boot files. However, if you are multi-tasking applications, such a procedure could delete modules that other applications are still using. Hence, delete all RmKill commands that you may have added 'BU'. Also, if you've added a -Max entry to the WimpSlot command in the !Boot file for, for example, !1stWord+, you may wish to remove the entry, or at least increase the value.

Gain (a little) speed with RMfaster

In all Archimedes (and A3000s), the ROM runs slower than the RAM. Hence, modules built into RISC-OS run slower than those loaded off disc. One possible solution discussed in the past in Archive is to make the MEMC run the ROM at RAM speed. This may or may not work, depending on the particular ROM chips. The *RM-Faster command (see page 351 in the A400 user manual) copies modules in ROM into RAM to gain a speed increase of, in theory, 33%. BU,

there probably wasn't enough memory to make this an attractive option. A problem is that as you can't *RMFaster modules that are active - you can't, for example, speed up the DeskTop once it's been loaded.

The way to get round this is to *RMFaster appropriate modules in the boot-up process, in the same way that applications can be loaded automatically. On power-up, all the required modules will be ready in ROM. However, on a Reset or <ctrl-break>, they will be in RAM, with the ROM versions unplugged, and hence not able to be *RMFaster'ed.

Therefore, if the same automatic process is to be followed both on power-on and on a Reset, all modules to be copied into RAM must first be *RmKilled (to delete existing RAM versions) and then *RMReInitd (to 'de-unplug' the ROM versions).

It is a matter of conjecture - or very difficult measurement - about which modules will most improve the performance of your machine. I'm experimenting with three, but would be glad to hear of other ideas. So, my complete !Boot file looks like this:

```
| Stuart's !boot file, Feb 1991.
!NewModes
rmkill draw
rmreinit draw
rmfaster draw
rmkill desktop
rmreinit desktop
rmfaster desktop
rmkill windowmanager
rmreinit windowmanager
rmfaster windowmanager
Desktop -File scsi::winny.$
.StartList
```

Use a RamDisc

BU, RamDisc was a joke. With a hard disc, even AU, I'm not convinced that a RamDisc is of great value but some people may want to try it. For floppy users, it will definitely be worthwhile, especially for holding the !Fonts directory and giving very quick access. Be very careful if you use RamDisc to hold files on which you're working. Set the size of RamDisc using the

*Configure RAMFsSize command. (In my experience, Impression can still crash and therefore you can lose your document if it is totally in RAM. Ed.)

Consider your application set-up

Both word-processors and DTP packages often include a spelling checker and a dictionary. However, BU there may not have been sufficient memory to run them sensibly. It's well worth checking the manual for each package to check for facilities that you never used BU, and may have forgotten exist. For example, I've now set up Impression II to load the dictionary on start-up and check each word as I type. No excuses for typographical errors any more!

Think about spooling your printing

RISC-OS lets you send the output from your application (assuming that it uses the printer drivers) to a file for later printing. The theoretical advantage is that when a file is being printed, you can continue to use the application, whereas printing directly from, for example, Impression, stops you doing anything else. A detailed explanation is in the Nov-Dec issue of 'Archimedean' sent out by Computer Concepts and in the February *Archimedes World*. BU, it was more memory-efficient to load the printer driver and then quit it, leaving

the actual printing module loaded. AU, background printing is possible. However, I find that, with complex printing tasks using the !PrinterLJ, it takes almost as long to write to disc (which hogs the whole machine) as it does to write straight to the printer!

Think about a 'Sticky Backdrop'

An idea borrowed from the world of the Apple Mac, a sticky backdrop, allows you to make directories or applications 'stick' onto the desktop surface and be accessed simply by clicking on them. If such items are normally kept well down your directory structure, access can be much quicker. Also, the dull plain desktop can be replaced by a customised pretty picture, and a whole background drop, and automatically loaded on boot-up. BU, the 80K that my !StickyBD application (available on Careware 6) demanded made it non-viable. AU, I tried it for a while, but decided in the end that I preferred to load my applications and open the main document directory automatically in the ways described earlier in the article. It's a matter of preference but it's worth trying !StickyBD if you can get a copy.

Well, that's it! A 4mb (or even 2mb) Archimedes is quite a different machine. I hope that these tips will help you make the best use of your expanded memory. **A**

Pen Down Update

Dave Morrell (& Doug Weller)

Some time ago, I (Dave) did a review on the pre-release version of PenDown (Archive 3.12 p48 + 4.1 p42). This is intended to update some of the comments in that review after I have seen the final release version.

Most of the basics remain the same. Along the top of the page is an icon menu from which various selections can be made. There are two new icons along this menu. At the extreme left there is an icon to swap between text and graphics. With the pen nib selected, text in the chosen font, size and colour can be typed in from the keyboard. Sprite graphics, but not draw files, can be dragged onto the page. With the pencil

selected, the sprite can be positioned, sized or deleted using the mouse.

The select button is used to position the sprite and the adjust button is used to size it. If the wrong sprite is dragged onto the page double clicking on it with select will give a query box asking if you wish to delete it. Pictures can also be deleted by dragging them off the PenDown page. Text can still be entered in this mode but the text caret will not respond to the mouse.

Next to this icon there is another new icon which swaps between insert and overwrite mode whilst typing. The icons for leading and justification have also been changed.

The main menu is still brought up by clicking <menu> over the document. This has one

addition to the pre-release menu. PenDown now has a spelling checker. It does not have a check-as-you-type mode but will check single words, parts of the document or the whole document. The spell check window contains five "push button" panels. 'Cancel' is obvious. 'Learn' gives the option of adding an unknown word to the dictionary. 'Try again' allows the user to have another go at spelling an incorrect word. 'Suggest' gives a list of words that may be the one required. If the correct word is in the list, clicking on it will automatically replace it in the text. 'Next' will move you along to the next unrecognised word.

Also on the spell menu there is a 'To file' option. If this is clicked, PenDown will search the document for any unrecognised words and produce a list to be saved to disc. This could be used as a record of spelling difficulties or as a basis for further work. With this option, the spell check window does not appear on screen.

Clicking <menu> over the PenDown icon on the icon bar produces another short menu. This has four entries. 'Info' leads to a window giving information about the program, name, purpose, author and version number. Clicking on 'Fresh start' will clear the document from memory for somebody else to use the program. If the document has been altered since the previous save, a check window appears before clearing the document. 'Configure' sets up a rather complicated looking window for changing the start-up settings of PenDown. This is very comprehensive and governs what will work on the icon menu and on the main menu. Non-working options are blanked out. This is very useful for younger children as they can be introduced to the various options gradually as they become more familiar with the program.

The manual has also been changed. I found it a model of clarity. It is easy to follow, explains all the functions of the program and is packed with many ideas for use. As a basic guide to word-processor use in education I can recommend the manual alone!

The two problem 'features' I found in the pre-release version have not, so far, materialised in this version, so screen refreshing seems to have been improved.

Three new outline fonts came with the new release but one from the pre-release version, Lineout, was missing. The new fonts are Futura, Gothic and Script. Futura is a 'stencil' type font, Script is a 'cursive' type font and Gothic is gothic. Unlike some other 'gothic' and 'olde english' fonts I have seen, this one is readable for lengthy passages.

The program is now heavily protected against copying. A copy can be made but the original key-disc must be used to get it running. Having worked in schools for many years, I know how easily accidents can happen and if something happens to the key-disc I hope Logotron would replace it without charge. Nothing about this is mentioned in the manual although an extra sheet of information states that protected discs can be bought without documentation for £20 by registered users.

The only minor niggle that I have so far found with the program is the lack of borders as found on the old BBC version.

There are two other programs on the disc. !Cloze will produce cloze procedure worksheets by dragging a text file to it. The frequency of the missing words can be set by the user. I would like it to have saved the missing words as a separate text file as well, but you cannot have everything. The other program !WordList will decode the main dictionary so that changes can be made to it.

I am still happy with the program and am confident that it will have a future in schools.

Doug Weller adds...

I've been able to use this program with my class of 8-9 year olds, and my 12 year old son has written a 6,000 word story on it. Its ability to print on various sizes of paper – A3 to A6, portrait or landscape, as well as fanfold (including fanfold rotated), is very useful. Pendown has a very powerful Search and Replace facility, although a simplified menu can be selected for younger children. It also allows a word count on single words, which could be very useful in showing children how many 'ands' and 'thens' they have used! Or, of course, one could use it to make frequency counts of letters. Another feature

it has that I wish my Impression II had is a copy/delete to bin. This moves marked text to a scratchpad. But, unlike most other Archimedes word processors, you can view the scratchpad (the Pendown 'bin'). Even more useful, the bin will hold more than one block of text. As far as I can see, the bin's capacity is only governed by the amount of memory in your computer. Once it

is open, you can choose which block of text you wish to copy back to the original document. !Wordlist is a very nice freebie. Besides allowing you to add words to the dictionary, it also does anagrams and subgrams, searches through a list of words or your dictionary, does frequency counts of all the words in a text and sorts them either alphabetically or by frequency. **A**

BookBinder

David Hart

To quote from the introduction to the User Guide: *"BookBinder is an application for the Acorn Archimedes computer that enables you to create books which are multitasking interactive text/graphics. They can be used as multiple choice quizzes, programmed learning sessions, interactive fiction, interactive graphical display databases or presentation software. This is achieved simply by dragging icons; there is no need for any code. Despite this simplicity, BookBinder is a powerful specialised programming language capable of producing a wide variety of books. Once finished, the book may be copied to any disc and sold, or freely distributed. In the true spirit of the desktop many books may be opened at the same time."*

How well does it meet these aims?

I certainly found it easy to create my first book. The tutorial section of the User Guide is easy to follow and allows the first time user to quickly get the hang of creating a book. One point I would make is that, although the explanation of creating a book was clear, there were no notes on how to edit a previously written book, so when I returned to a book I had started previously, it took some time and thought as to how to add extra pages.

What is a Book made up of?

BookBinder takes "pages" that have been made up by using !Draw. Thus, you need to be able to use !Draw before you can use BookBinder. As !Draw files can be made up from sprites and text, you can use other packages to help you create the !Draw files. BookBinder is supplied on a single

disc but, as it requires the a !Systems folder and as it is also useful to have the !Draw and !Paint applications and the !Fonts directory handy, you are asked to create two working discs – "Drawing" containing !Binder, !System, !Paint, !Draw and !Edit and "Binder" containing your !Fonts and !BookRead, Converter and the Examples folder from the master disc. Musbury Consultants include two disc labels for these discs. (One minor niggle – the User Guide asks you to name one of the discs "Binder" but the label for that disc says "Binding".)

Creating a book involves copying an application called !BookRead, and giving it a new name and opening up the Pages folder within this application's directory. You then drag your pages into this folder and create the links between the pages. This is done in two stages. First you open up the plan of the book and drag the pages into the plan. The plan then consists of a set of rectangular boxes with the page names and a START and END box. By pressing <menu>, you can then establish links between the pages. Once a link has been established between two pages you can then decide which "button" on the first page will call the second page. A "button", as far as BookBinder is concerned, is an object in the !Draw file. When you go to make a button a window is opened showing the !Draw file and you can select the !Draw object to be made into the button. Once you have finished creating the links, you then bind your book together.

The User Guide also gives details as to how to change the !Sprites file within your new application to give the application its own unique icon on the icon bar and disc window.

How do I rate BookBinder?

Obviously, it does not have as many features as Genesis or Magpie. You cannot have music from Maestro files or animation from Euclid and Film Maker. It also lacks the page creation facilities of Genesis. Each page of a BookBinder book has to be created in IDraw. However, I certainly found it easier to use than Genesis and its books took up less room. I would suggest therefore that if you wished to create books (hyperbooks?) that do not use animation or sound, BookBinder (at £50 through Archive) represents good value for

money. On the other hand if you require the extra features offered by Genesis (at £85 through Archive) or Magpie (at £57 through Archive) then, obviously, you would have to choose one of those.

One last thought

As with all HyperMedia packages, the ease of use is only the first step. It is the designing and planning of the "book" that is the important part. Remember that, with these packages, it's a case of: "Garbage in HyperGarbage out!" **A**

Help!!!!

• **Exabyte tape streamers** – I want to be able to run an Exabyte tape streamer from an Oak SCSI interface. Does anyone have any software I can use? These tapestreamers use small 8mm video tapes and are relatively cheap. John Gibson, Grantham.

• **Hardware project** – After Alan Bryant's comments in the Help Column last month, we've had one offer of a suitable project – a combined PAL coder / VIDC enhancer / genlock. I've put the two of them in contact, but if anyone else is interested, drop us a line. Ed.

• **Keyboard compatibility** – Is the A400/1 keyboard compatible with any PC Clone format? Some use the same plug, and there are add-ons such as bar-code readers, key-pads etc. Nik Kelly, Liverpool.

Help offered

• **Epson MX80 driver** – Many thanks are due to the wizard at Clares who wrote a driver for my old Epson MX80 F/T III, circa 1982. Yes, folks, it can be done! Nik Kelly, Liverpool. **A**

Orrery Version 1.3

Maurice Dixon & Ruth del Tufo

Orrery is a computer model of the solar system. It shows the motion of the planets from space-time co-ordinates which can be user-defined. The planets are set against a background of stars which may be joined to show the constellation figures.

The original Orrery was a clockwork model of the solar system made to demonstrate planetary motion. It was made in the eighteenth century for the 4th Earl of Orrery. Spacetechn have implemented and generalised this to include all the currently known planets. It is important to recognise the scope that Spacetechn set themselves; the Orrery is not concerned with the wider astronomical issues of the formation of galaxies, stars or the solar system. They are to be congratulated

on providing such an interesting scientific model as the Orrery for us to explore the solar system.

The review testing was carried out by a team of three people; one an ARM enthusiast, one an experienced many body modeller and one a seven year old school girl. None of us was either a professional astronomer or a science teacher. The testing was carried out using an ARM-2, a single floppy drive, a standard Acorn RGB colour monitor and a Panasonic KX-P1124 printer; this would fairly replicate the A3000 environment.

Planets

The main Orrery allows the user to select a date and time for which the position of the planets are derived. The user can select the rate at which the model will then progress into the future. Each

planet is represented by a distinct icon; Spacetechn have taken a practical approach to allowing the user to 'tune' the screen to the current requirements. You can choose to allow the orbits to be displayed with full or partial orbital arcs available. For clarity, you can choose to display the initial letter of the planet or to omit a planet icon altogether. Basic planet and orbital information such as size, eccentricity, angle to plane, planet radius, distance from earth, mean and actual distance from the sun and perihelion is given by selecting the planet in its orbit. For the geocentric viewpoint, the angle with respect to the celestial equator and azimuth are given. It is often necessary to freeze the motion before selecting the planet. The model makes heavy demands on the ARM-2 so response to selection or menu choices can appear sluggish. The motion in the orbits can be jumpy and the orbits themselves are shown as a series of straight lines which looks a little untidy.

The power of Spacetechn's Orrery is seen in the way that different frames of reference may be defined. A view may be chosen which is centred on the sun and a selected planet locked onto. A user can consider themselves to be looking in any direction at the sky from anywhere on the earth at any time. It is a delight to watch the sun rising with a group of planets moving close to the ecliptic. Spacetechn have provided a lighting background to show the black of night, the dark blue of twilight, and the brighter blue of daylight. The user can choose to have the directions displayed on the horizon and change direction as the planets move. The configuration may be printed as a sprite picture using !Paint; surprisingly, the new moon which was not visible on the screen can be clearly identified in the picture and then confirmed using the mouse pointer. It is this earth based view of the sky which desktop astronomers will find so attractive.

There is a very simple line graph of the planets with a distance scale normalised to the size of the earth's orbit. Not all the planets can be seen together but the search out along the axis emphasises the enormous distances to the further planets compared to the inner ones. Surprisingly, the planet data is not available off the line graph.

The model does not appear to incorporate the Asteroid belt or Comets.

The Orrery also includes the facility to display as a graph the angular displacement of the planets from the sun for a user-chosen year. The colour screen display was not easy to read and the black and white !Draw printout effectively lacked the contrast to make all the planets visible.

Stars

It is possible to display a large number of stars as a background to the planetary display. The stars are grouped in constellations and it is possible to use the mouse pointer to select a star for identification. The star identity and constellation are displayed as a superimposed window while the actual star is marked with a cross on the Orrery window. The user can select to have the stars joined to give the familiar constellation figures and this immediately attracts interest. The shape of the sectoring of the sky into the 88 constellation sectors is not displayed.

Using the earth as a reference frame, the motion of the stars can be tracked. When a heliocentric view is chosen, the sun is treated as another star, is barely detectable and has surprisingly little data associated with it. The star data is displayed even when the model has star displays suppressed. Using the geocentric viewpoint, it is possible to display the track of the sun when the grid is chosen.

Moon

The earth's Moon is included in the model but not the moons of other planets. Detailed positional information and a phase description for the Moon is available via the mouse pointer.

Glossary

There is a set of demonstration configurations which can be used to illustrate some of the astronomical terms. Some of these work very well for illustrative purposes but others, Conjunction and Opposition, sent us scurrying away to the encyclopaedia to check both the meaning of the term and what would be expected. The difficulty arose because the terms apply to an earth-based reference frame for which the user can alter the control panel. A glossary should explain and

illustrate in an immediately accessible way the chosen item. In contrast, the illustration of circum-polar stars and planetary retrograde motion was immediately understandable. The display of twilight, sun rise, noon and sunset were all OK.

Dates

The date range for the Orrery was from the year -9999 to at least 9999; the only significant bug in the system that we found related to putting in too big a year number and not being able to back out of the warning; a similar error occurred with the control panel for accelerated time increments. We do not consider these to be serious difficulties. For the Ephemerides the date range was 0 to 99999.

Data access

The primary access to the data is via the mouse pointer with display on the screen. It would be nice to be able to extract the fixed data and dynamic data for the planets into a printable text file. It would also be attractive to be able to invert the presentation so that having given a planet and a date it would be possible to use the Ephemerides data to display the planet.

Many body problem

The calculation and display of the positions of the planets and stars by Spacetechn's Orrery makes heavy demands on the processing power of the ARM-2 but they are met in an acceptable way. No indication is given of the calculation method used or the accuracy of the data. Questions about Planet 'X' or '10' are currently being discussed and users should be aware of how orbital irregularities are incorporated.

Perspective issues

There are enormous variations in distances, light intensities and relative sizes in the solar system so any representation has to reflect a compromise based upon the primary area of interest.

The control panel window allows the user to select a time granularity from 1 minute to one of many years; the screen can also be frozen for detailed inspection. This enables the detailed study of such different phenomena as sunrise and the out of plane orbital motion of Pluto. This is an excellent facility and can be run forwards and

backwards in time. A small quibble is that it would be nice to be able to freeze/unfreeze a screen on a toggle key without having the control panel window displayed.

The control panel can also be used to display the orbital motions of all the planets or gradually to focus on the inner planets. A similar magnification facility would benefit the simple linear graph.

Documentation

The manual was helpful as far as the introduction and installation were concerned. The layout of the section on menu selections should be improved and made more systematic but it was adequate for an introduction. There is a useful glossary provided of astronomical terms although we feel that the explanations could have been fuller and easier. Also, it would have been useful to know the basis of selection for the set of stars displayed and whether they are fixed or moving.

Installation

The installation instructions were straight forward and worked. The installation procedure assumes the user is familiar with the desktop environment. It is good that the product is capable of simple backup. The disks are magnetically version marked but not in text on the outside of the disk. The files supplied are different from those given in the text; Glossary is omitted from the text while Or_Setup is used in the text whereas Now and Intro are on the disk. These in no way affected the installation but perhaps could be misleading to someone not familiar with the desktop environment and seeking to proceed systematically. The manual claims that Orrery is RISC-OS compliant and certainly we have been able to run it at the same time as Impression Junior.

Summary

In Orrery, Spacetechn have produced an excellent model of the solar system which will be used by many would-be astronomers with great pleasure and interest. The underlying scientific model should be made available. The software is robust and covers the scope stated in the documentation. It can be installed quickly and easily. Orrery makes heavy demands on the ARM-2 and can appear sluggish. **A**

Honeypot Lane

Peter Thomson

This is a well presented package of story books and computer programs aimed at the primary school. Resource, who produce the package, suggest that it should form the basis of an approach to primary technology.

The elements of the package are linked by an imaginary village. One large format book is well illustrated, perhaps suitable for the class teacher to read to a class of infants. The other three stories seem to be aimed at an older age group, with each page of text facing a picture.

The first program displays a very long sprite, a picture of the village and its surroundings. The user can scroll this picture horizontally. Clicking the mouse pointer on the screen displays the name of the object or a line of story about that scene. Clicking on the front door of the castle lets you in to explore the castle. On certain house doors you can also move inside but the number of rooms is very limited.

A group of young girls who worked with the program found this great fun until they had explored the whole area, but then complained that there was nothing more to do. A picture of Albert the mouse can be hidden in the various rooms for others to find and this provided more stimulus for a short time. The girls would have liked to add their own story and more details to the picture, but the program does not allow this.

I looked at the programming to see what could be done. The long sprite of the village can be loaded into !Paint so that changes can easily be made to that, but the messages in the program are all in the form of data statements and changes would require a lot of programming experience. This is a pity, because the idea for this program is a good one, and the messages could easily have been included as a file so that new stories could have been written.

When I looked at the second program, I hoped to find that this would let the children produce their own story in the same format as the first but this is not the case. It is designed to produce a story made of single pages of text and graphics, displayed one page at a time. The picture can be built up from a library of simple shapes or from a large number of well drawn sprites. I found the procedure to select sprites from a file on one disc, transfer them to a second disc and then place them on the screen to be very messy — too complex for young children. The text editing facilities are also very limited. When a story is being displayed on the screen, much time is wasted as whole files of sprites are read from disc for each page.

The sprites themselves are excellent. The children already know how to use !Draw and !Paint. They were very excited by being able to add these to their own drawings. (You need to rename the main program from BASIC in order to display the files).

Neither program is RISC-OS compliant or compatible and I couldn't use them with my Taxan monitor because they deleted VIDC utilities and then adopted a non-compatible mode.

Also included with this package is a very expensively produced file entitled "A teachers guide to Primary Technology". It is a comprehensive list of possible ideas for using honey-pot as a stimulus for technology, but with little practical guidance for those new to this area. Also, some of the links to the package are a bit tenuous.

Conclusion

If the first program with its long village sprite and captions was available separately, I would recommend it. Overall, this package has limited value as a stimulus for primary school technology. There are much better practical guides for teachers available elsewhere. **A**

Fact-File

(The numbers in *italic*
are fax numbers)

Aleph One Ltd	The Old Courthouse, Bottisham, Cambridge, CB5 9BA. (0223-811679) (-812713)
Apricote Studios (p22)	2 Purls Bridge Farm, Manea, Cambridgeshire, PE15 0ND. (035-478-432)
A.S.T.E. Syracuse	10 Alastair Crescent, Prenton, Wirral, L43 0UR. (051-608-5469)
Atomwide Ltd (p18)	23 The Greenway, Orpington, Kent, BR5 2AY. (0689-838852) (-896088)
Base5 (p51)	PO Box 378, Woking, Surrey GU21 4DF.
Beebug Ltd	117 Hatfield Road, St Albans, Herts, AL1 4JS. (0727-40303) (-60263)
CJE Micros	78 Brighton Road, Worthing, W Sussex, BN11 2EN. (0903-213361) (-213901)
Clares Micro Supplies	98 Middlewich Road, Rudheath, Northwich, Cheshire, CW9 7DA. (0606-48511) (-48512)
Chalksoft	P.O. Box 49, Spalding, Lincs, PE11 1NZ. (0775-769518)
Cogent Software	30 Norton Way North, Letchworth, Herts, SG6 1BX. (0462-673017)
Colton Software (p12)	149-151 St Neots Road, Hardwick, Cambridge, CB3 7QJ. (0954-211472) (-211607)
Computer Concepts (p30/31)	Gaddesden Place, Hemel Hempstead, Herts, HP2 6EX. (0442-63933) (-231632)
Dabhand Computing	5 Victoria Lane, Whitefield, Manchester, M25 6AL. (061-766-8423) (-8425)
Data Store	6 Chatterton Road, Bromley, Kent. (081-460-8991) (-313-0400)
Design Concept (p 17)	30 South Oswald Road, Edinburgh, EH9 2HG.
Electronic Font Foundry (p32)	Bridge House, 18 Brockenhurst Road, Ascot, SL5 9DL. (0344-28698)
HS Software	56, Hendrefolian Avenue, Sketty, Swansea, SA2 7NB. (0792-204519)
Ian Copestake Software	10 Frost Drive, Wirral, L61 4XL. (051-648-6287)
IFEL (p41)	36 Upland Drive, Plymouth, Devon, PL6 6BD. (0752-847286)
Lingenuity (Lindis) (p36)	P.O.Box 10, Halesworth, Suffolk, IP19 0DX. (0986-85-476) (-460)
Longman-Logotron	Dales Brewery, Gwydir Street, Cambridge, CB1 2LJ. (0223-323656) (-460208)
Minerva Systems	Minerva House, Baring Crescent, Exeter, EX1 1TL. (0392-437756) (-421762)
Musbury Consultants	8 Fairhill, Helmsford, Rossendale, Lancs, BB4 4JX. (0706-216701)
Oak Solutions (p11)	Cross Park House, Low Green, Rawdon, Leeds, LS19 6HA. (0532-502615) (-506868)
Pandora Technology Ltd	9 St Marks Place, London, W11 1NS. (071-221-9653) (-9654)
Ray Maidstone (p4)	421 Sprowston Road, Norwich, NR3 4EH. (0603-407060) (-417447)
RESOURCE	Exeter Road, Doncaster, DN2 4PY. (0302-340331)
RTFM Software	43 Hill Street, St Helier, Jersey JE2 4UA. (0534-67870) (-68996)
Silicon Vision Ltd	Signal House, Lyon Road, Harrow, Middlesex, HA1 2AG. (081-422-2274) (-427-5169)
Simtron Ltd (insert)	4 Clarence Drive, East Grinstead, W. Sussex, RH19 4RZ. (0342-328188)
Storm Software\$\$	Beth House, Poyntington, Sherbourne, Dorset. (0963-22469)
The Serial Port (pp27 & 35)	Burcott Manor, Wells, Somerset, BA5 1NH. (0243-531194) (-531196)
VisionSix Ltd (p29)	13 Paddock Wood, Prudhoe, Northumberland, NE42 5BJ. (0661-33017) (-36163)

Archive

Subscription Magazine and Support Group for *Archimedes* Users

Archive Magazine contains:

- News
- Reviews
- Hints and Tips – a major feature
- Articles for Beginners
- The Latest Technical Information
- Program Listings
- Free Small Ad's Section
- HELP – Requested and Offered
- Contact Box – to help you form common interest groups

Bulletin Board: Ring the Archive BBS on 0603-745932, up to 2400/2400, scrolling, 8n1.

- Very Latest News
- Down-load Software
- Mailbox Facilities
- Chat line

Technical Help Service (£10 / year)

A telephone hot-line service for immediate help with your technical problems. Any member can send written enquiries, but for a fast response use the THS!

Members' Discount: Archive offers its members up to 15% off software and hardware from a range of different suppliers when purchased through Norwich Computer Services.

Subscription: 12 issues £17 (UK)
Europe £24, Australia / N.Z. £34,
Elsewhere £31.

Technical Help Service £10

For more details: Ring Adrian or Alison on 0603-766592.

N.B. All earlier issues have now been re-printed – you may back-date your subscription as far as issue 1 (October 1987) – to take advantage of this huge bank of information.

Archimedes is a trademark of Acorn Computers Ltd.

* Please send copies of *Archive* magazine for ____ years starting from...
Volume ____ Issue ____

* Please enrol me on the Technical Help Service for one year. (£10)

I enclose a cheque for £ _____ payable to "Norwich Computer Services".

Name: _____

Address: _____

Postcode: _____

Norwich Computer Services, 96a Vauxhall Street, Norwich, NR2 2SD

Special four-year subscription starting from volume 1, issue 1 – £52 (UK)